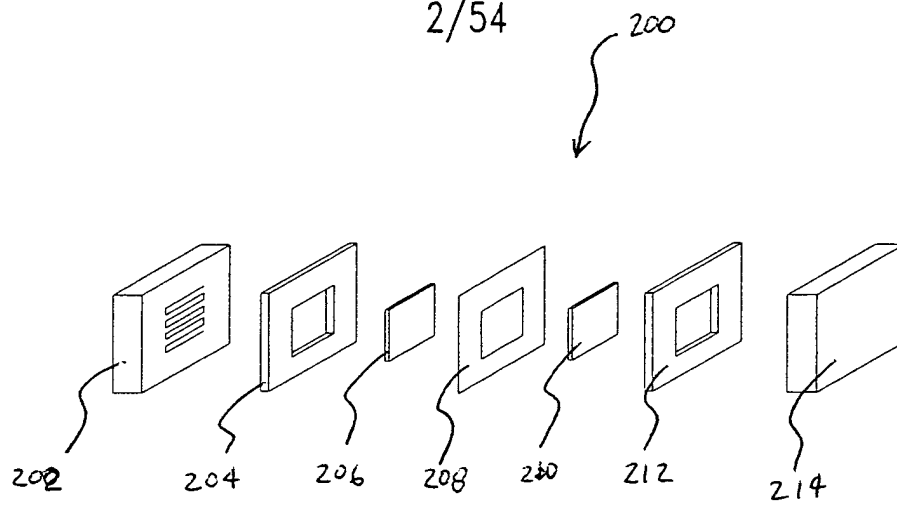
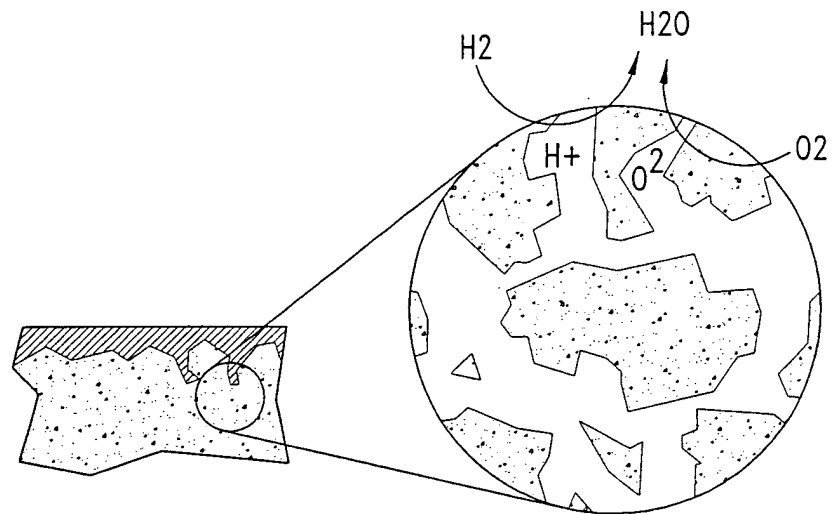


*Fig. 1*  
(Prior Art)

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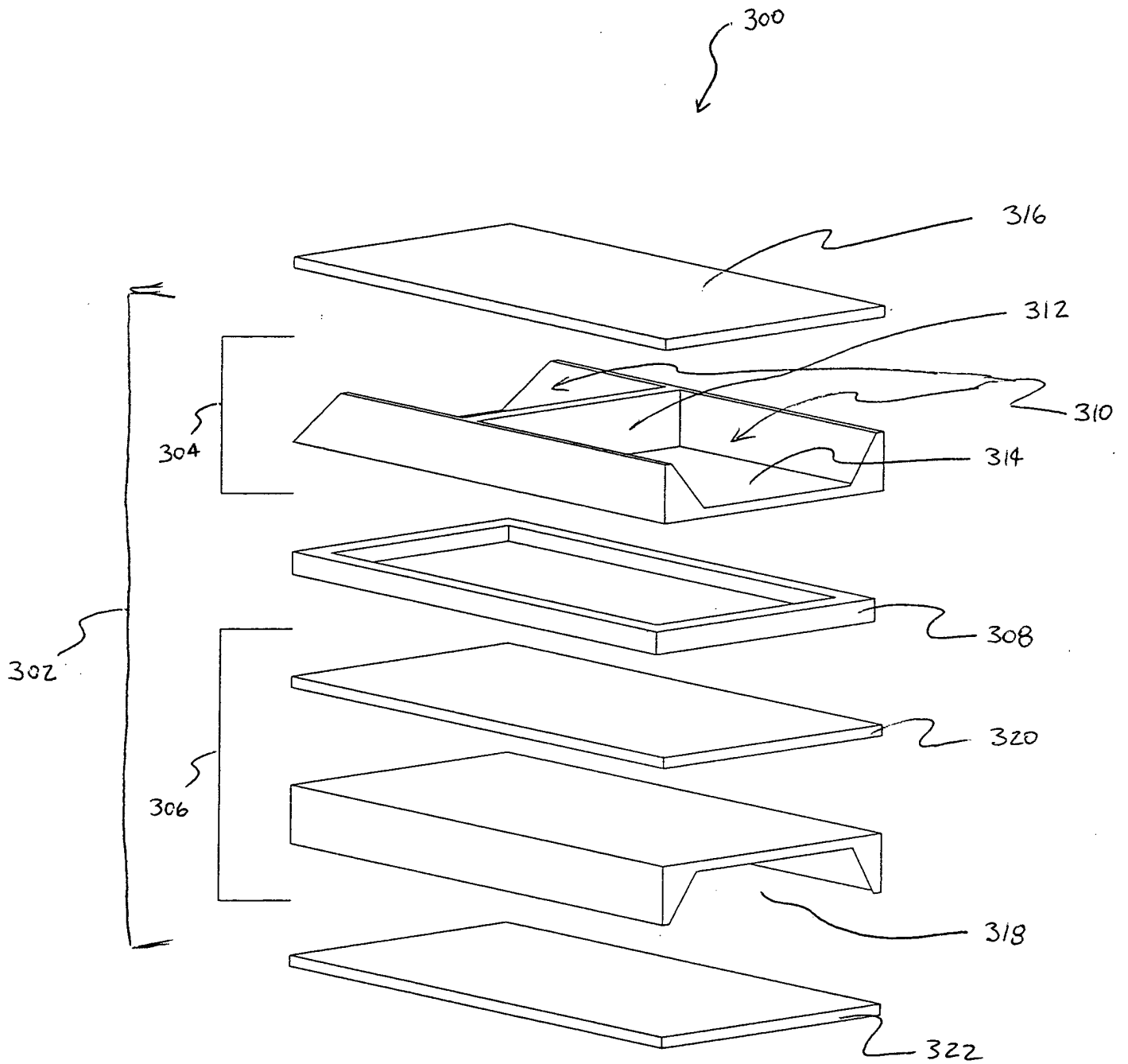


*Fig. 2A*  
(Prior Art)

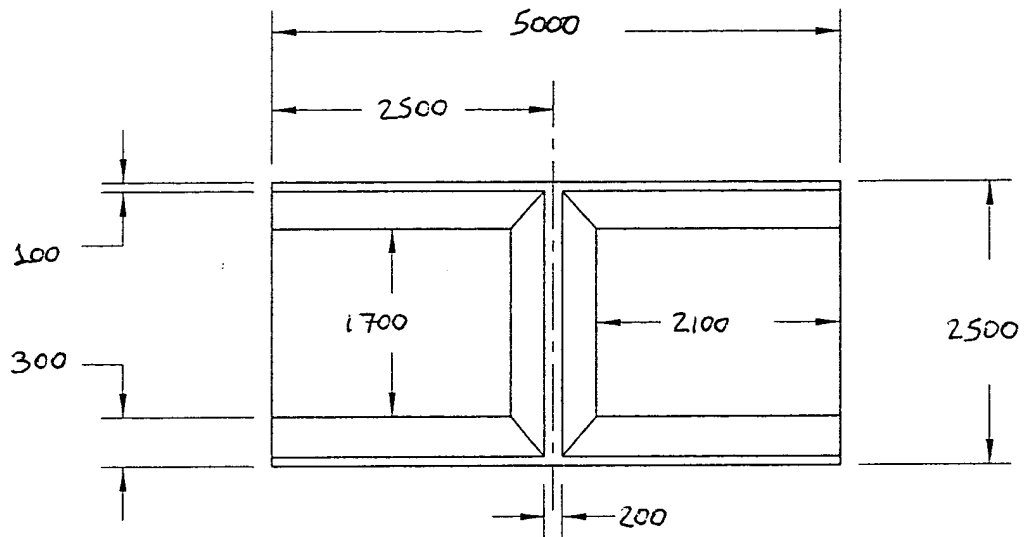


*Fig. 2B*  
(Prior Art)

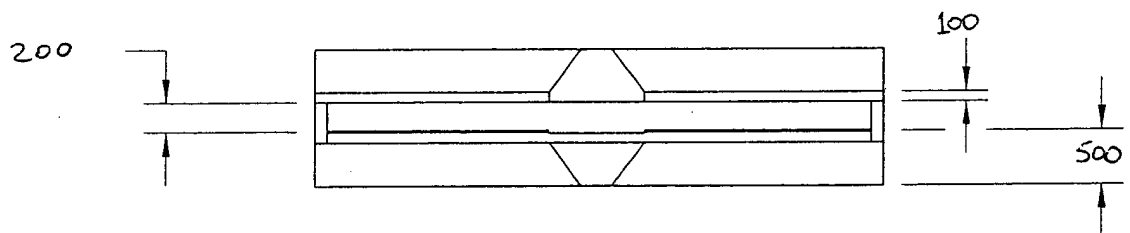
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*Fig. 3*

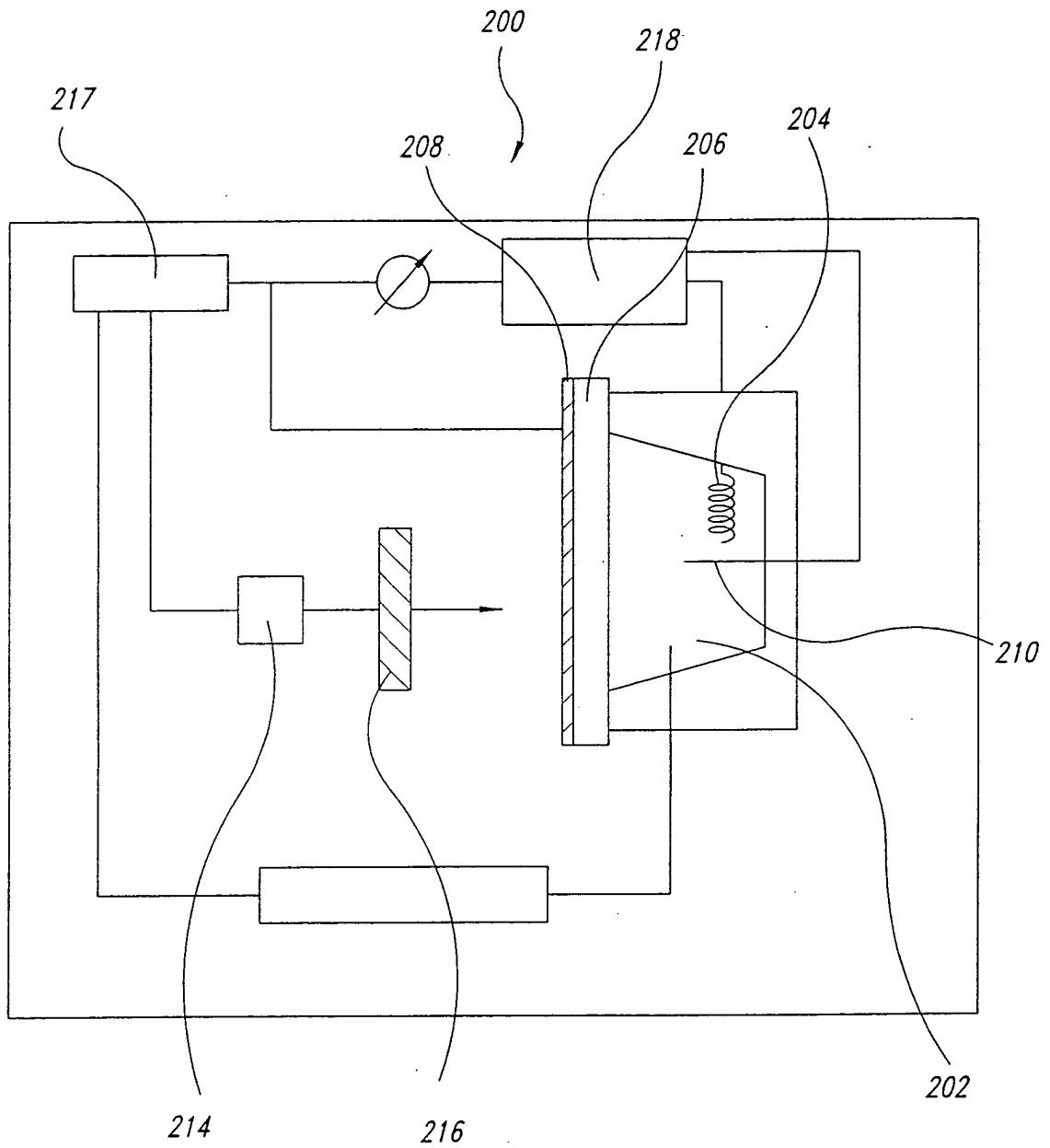


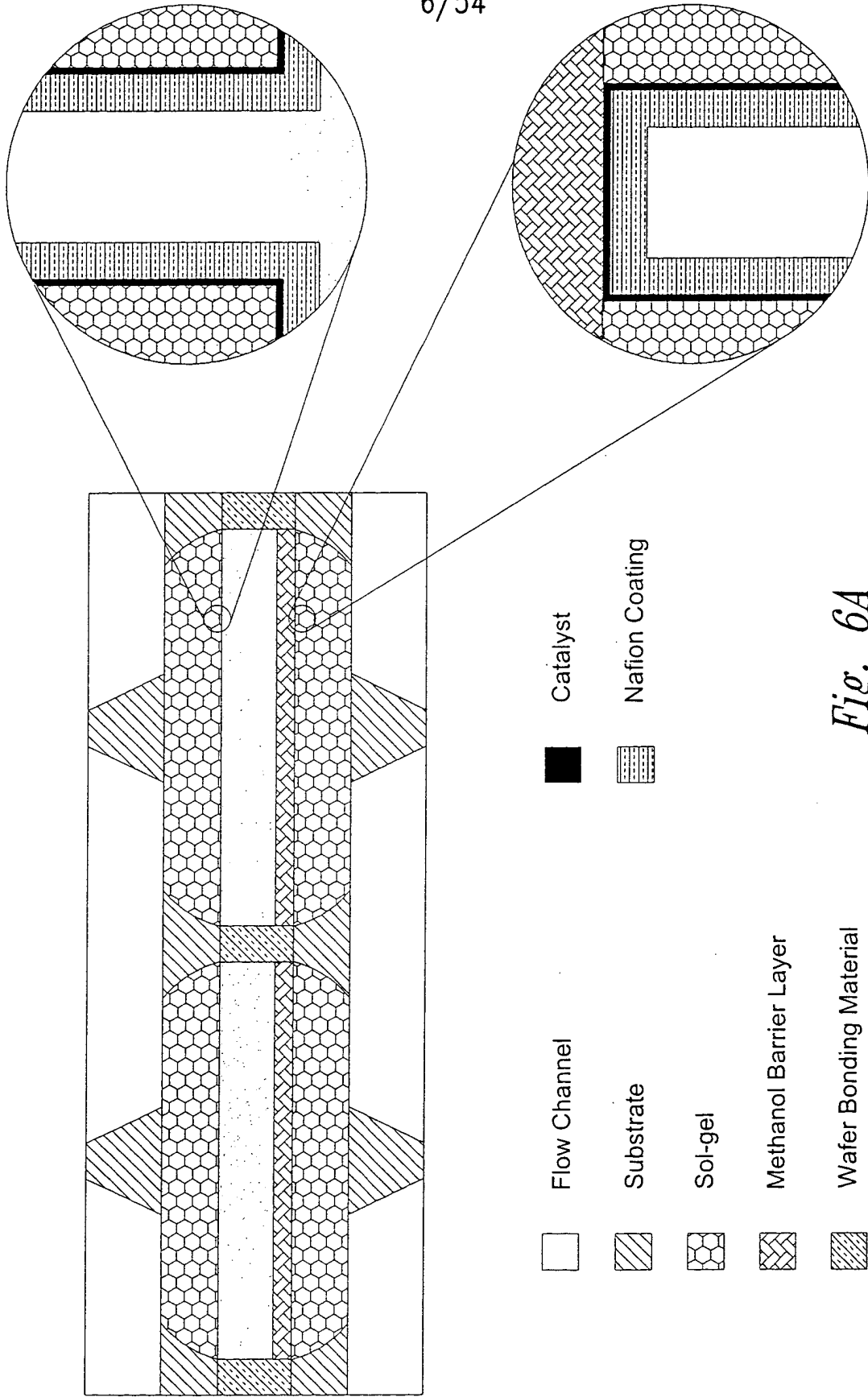
*Fig. 4A*



*Fig. 4B*

*Dimensions in microns*

*Fig. 5*



*Fig. 6A*

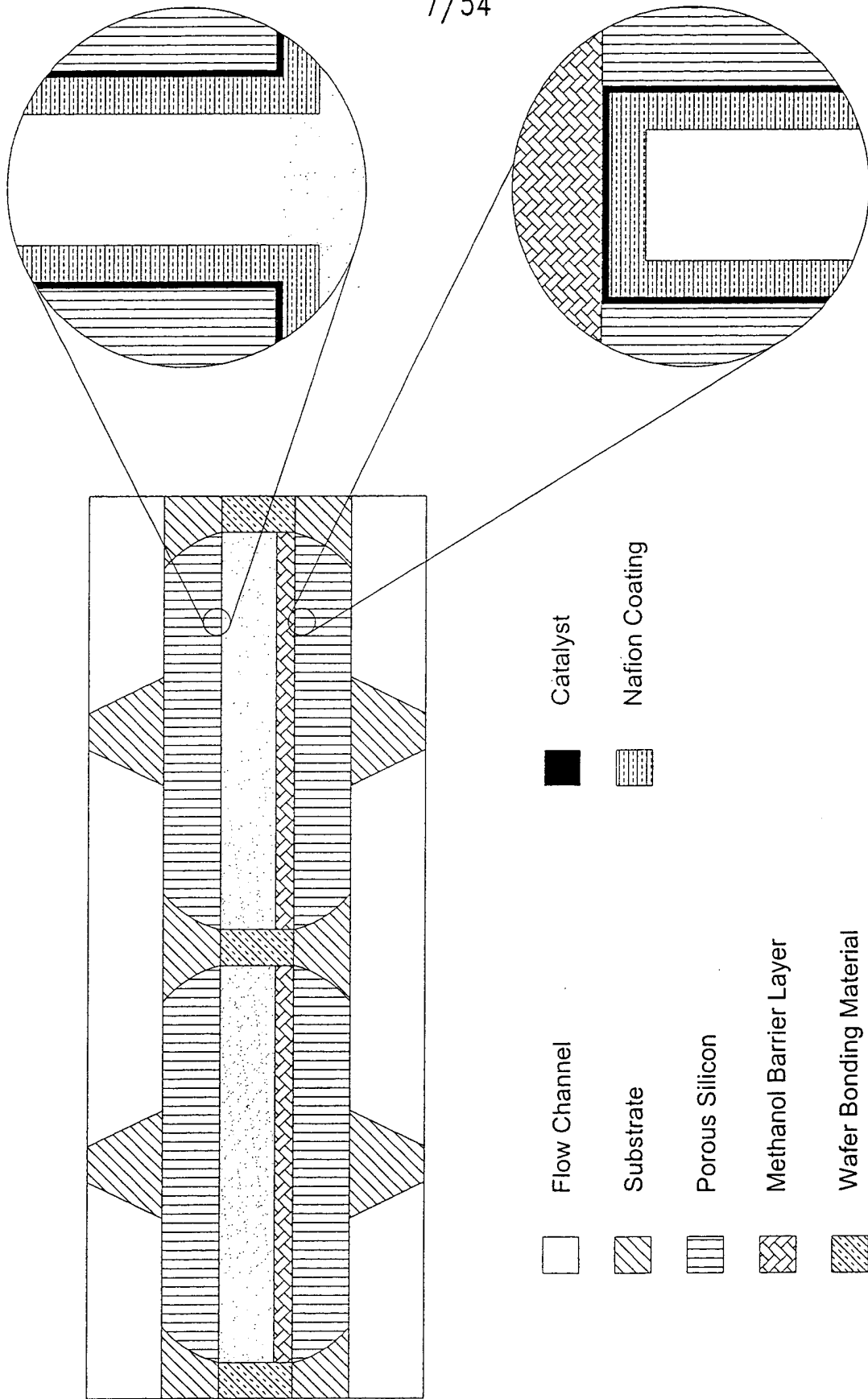
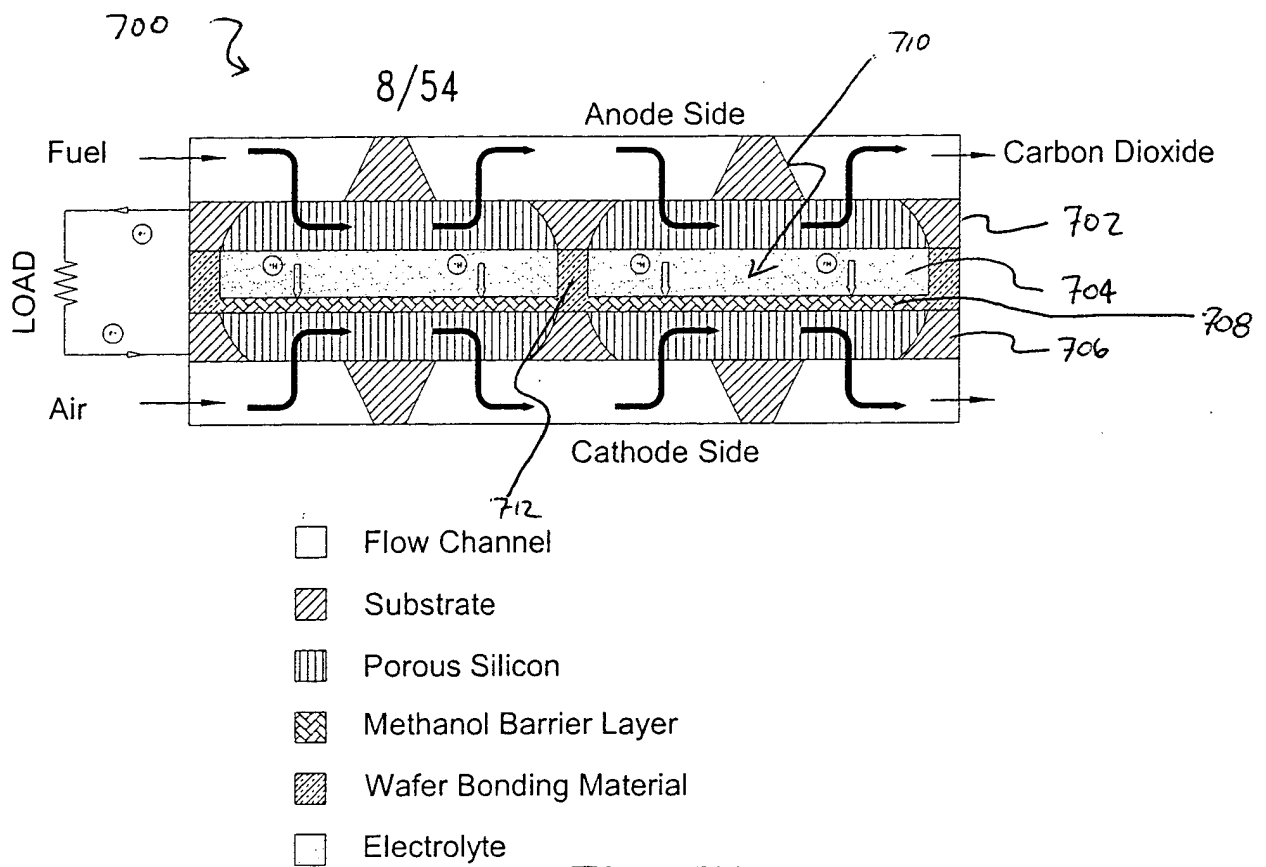
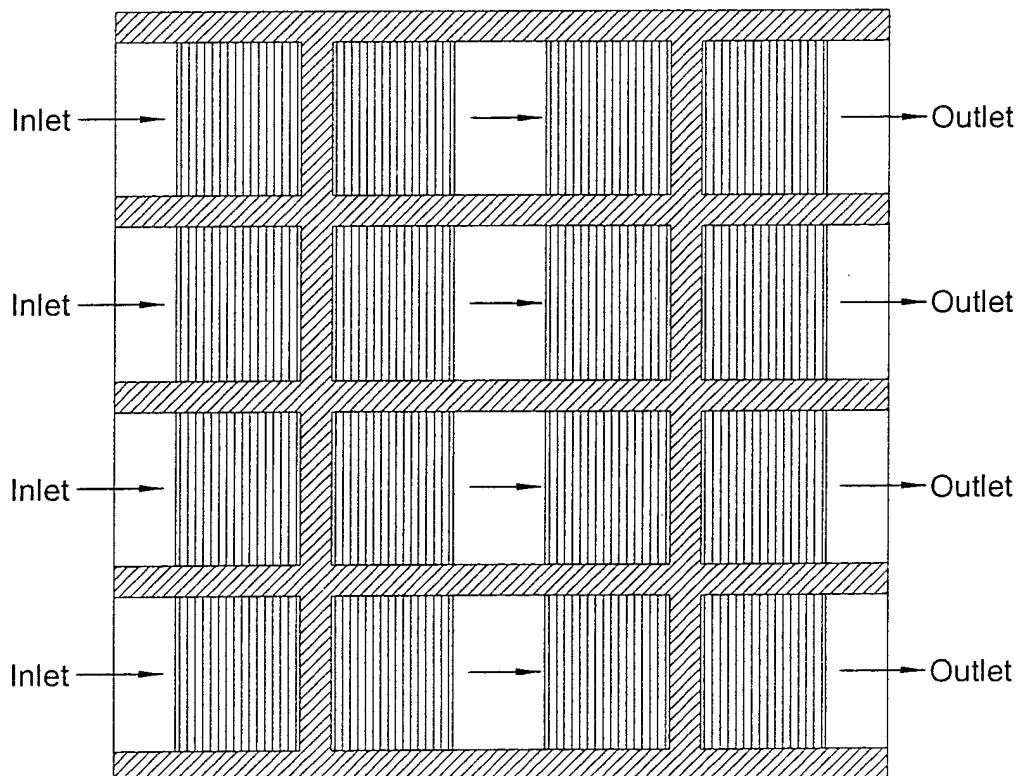


Fig. 6B



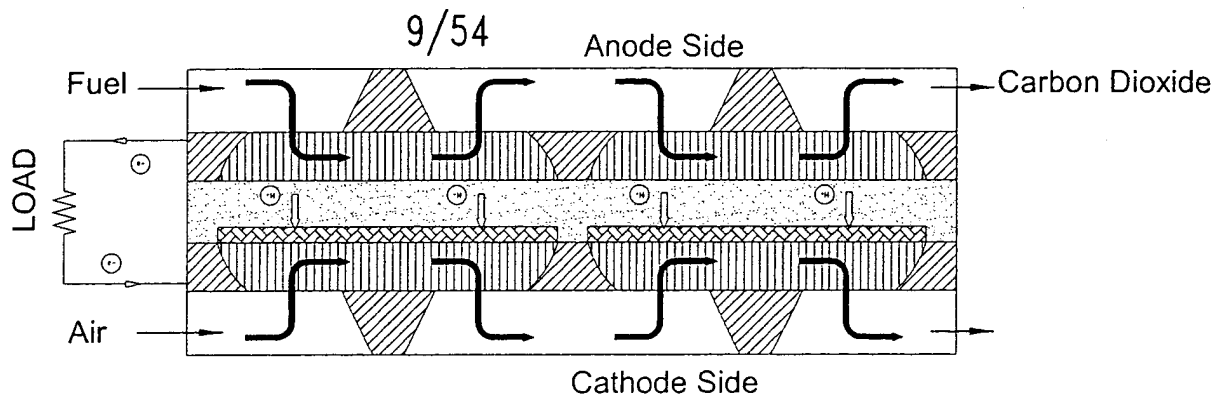
*Fig. 7A*






Top View (Anode and Cathode are similar)



*Fig. 7B*

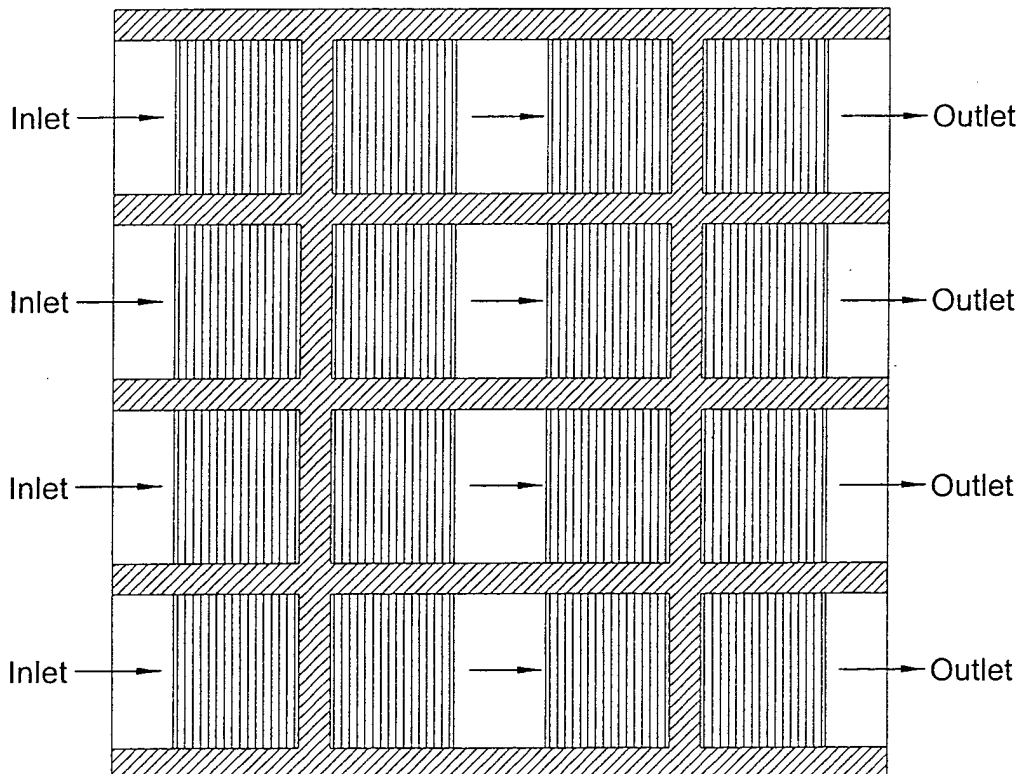




-  Flow Channel
-  Substrate
-  Porous Silicon
-  Methanol Barrier Layer
-  Electrolyte

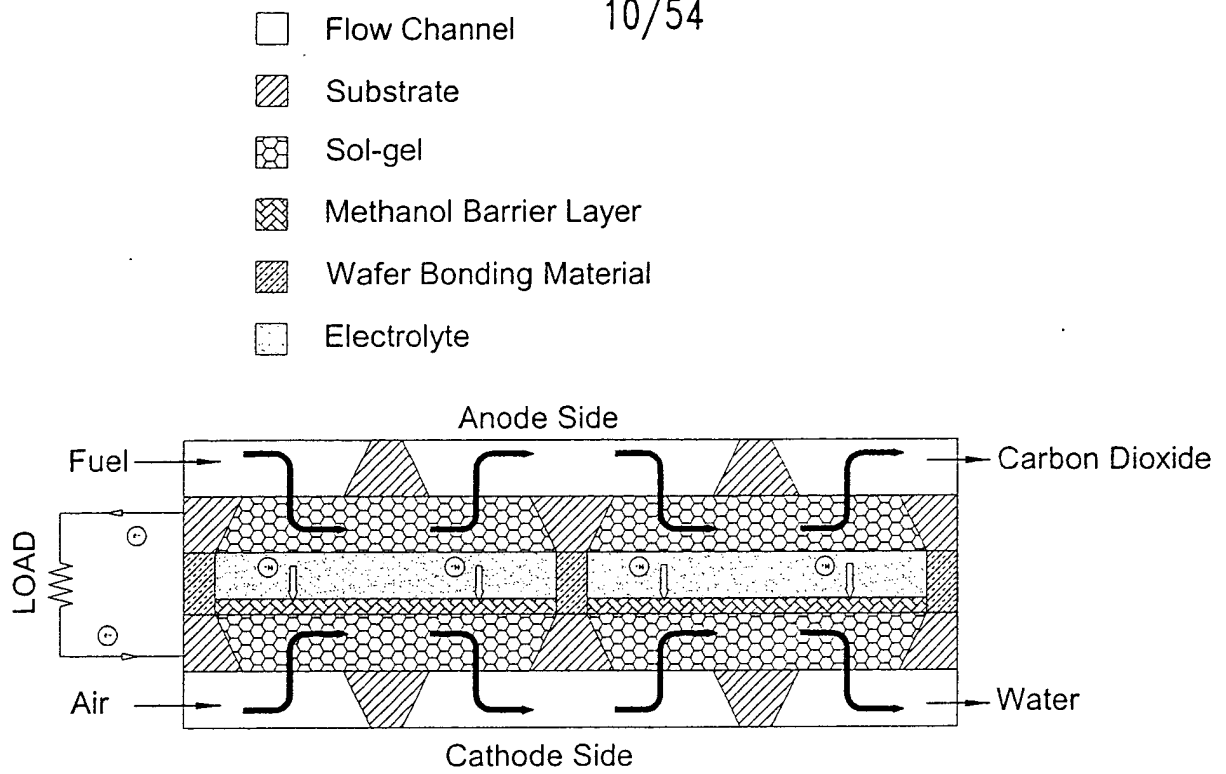
*Fig. 8A*

Top View (Anode and Cathode are similar)



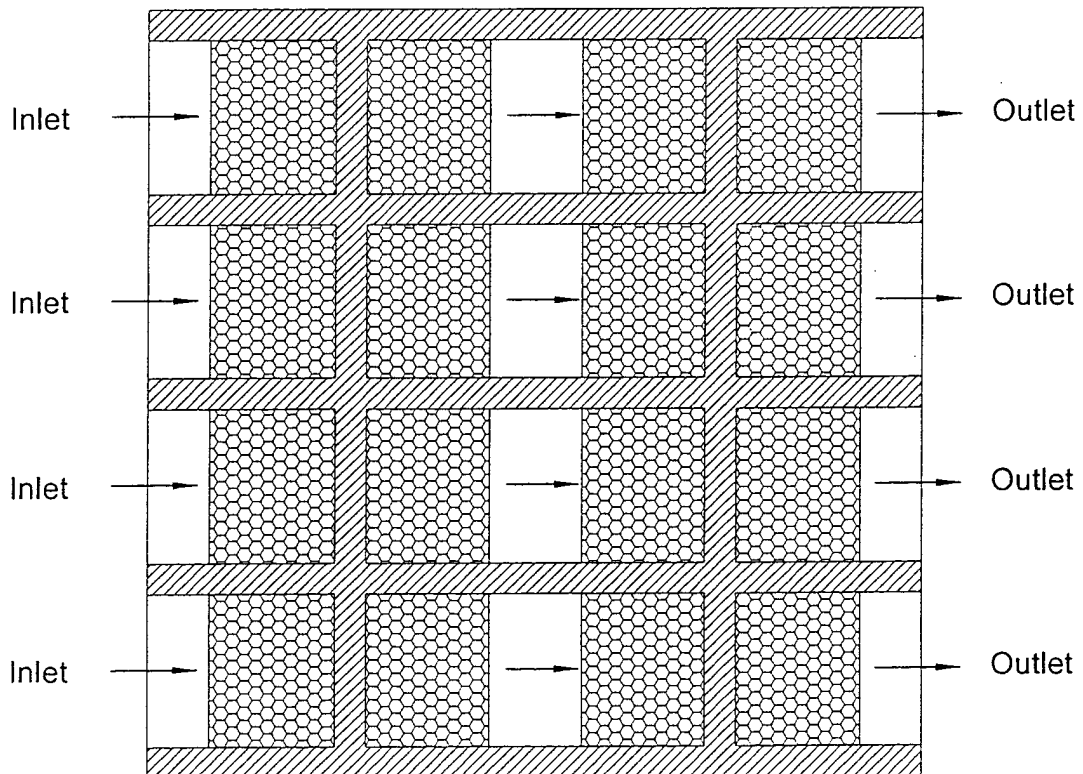
*Fig. 8B*

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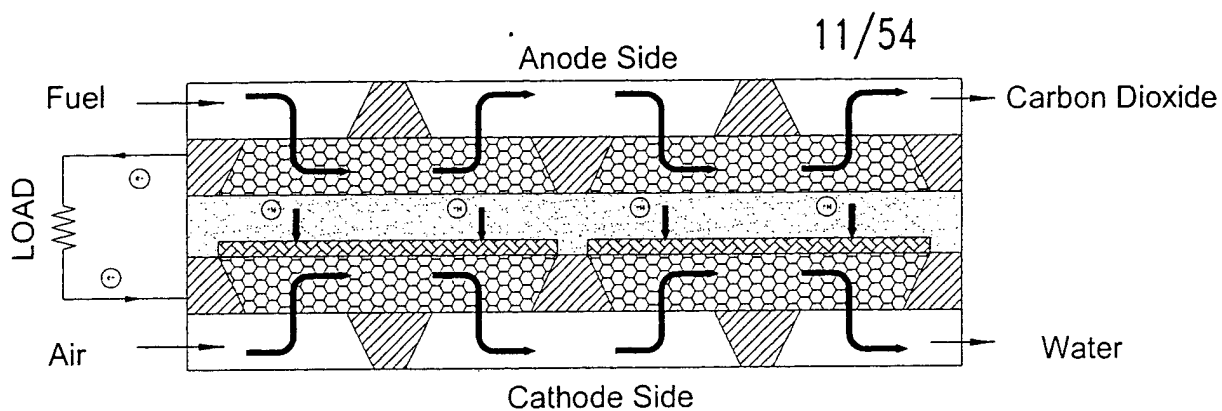







*Fig. 9A*

Top View (Anode and Cathode are similar)



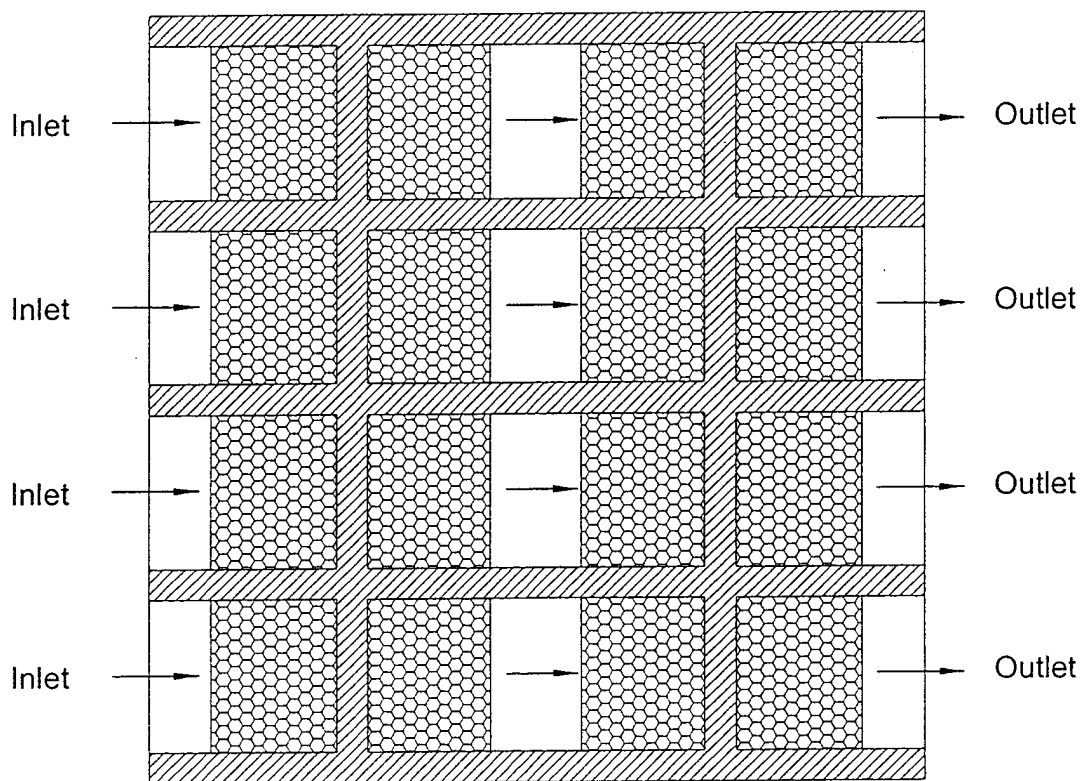
*Fig. 9B*



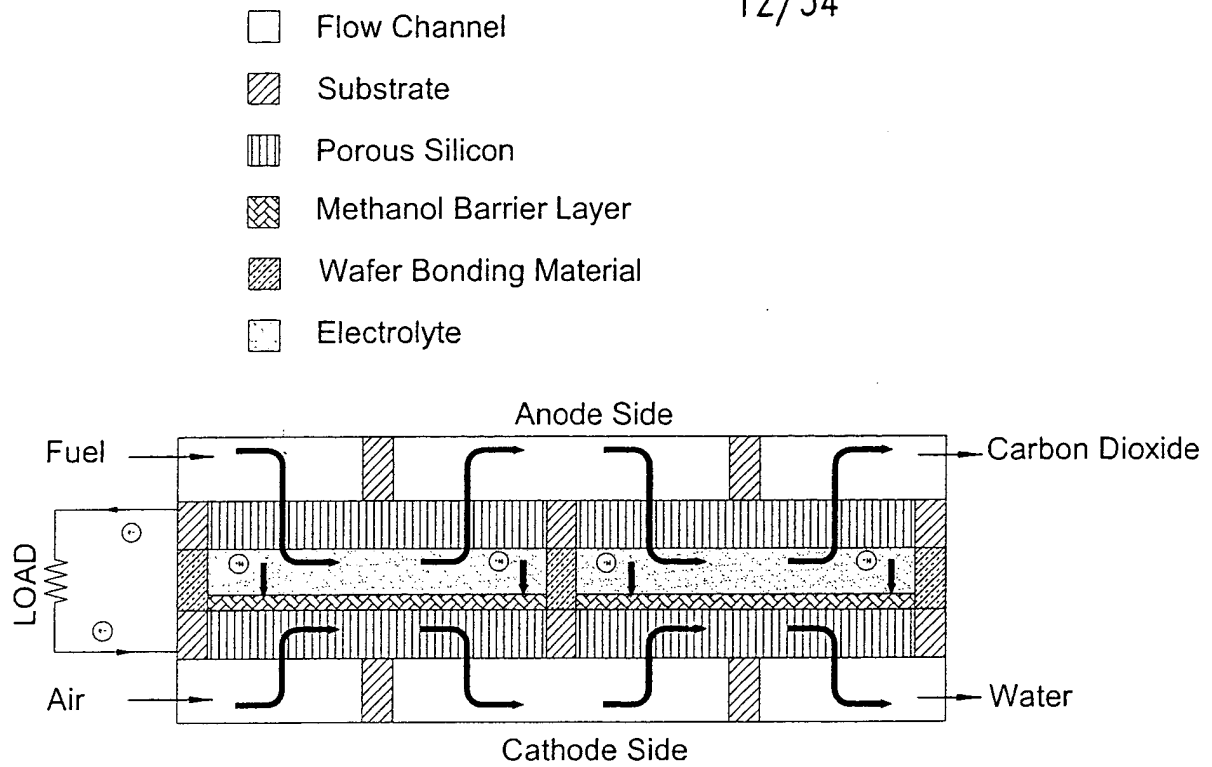
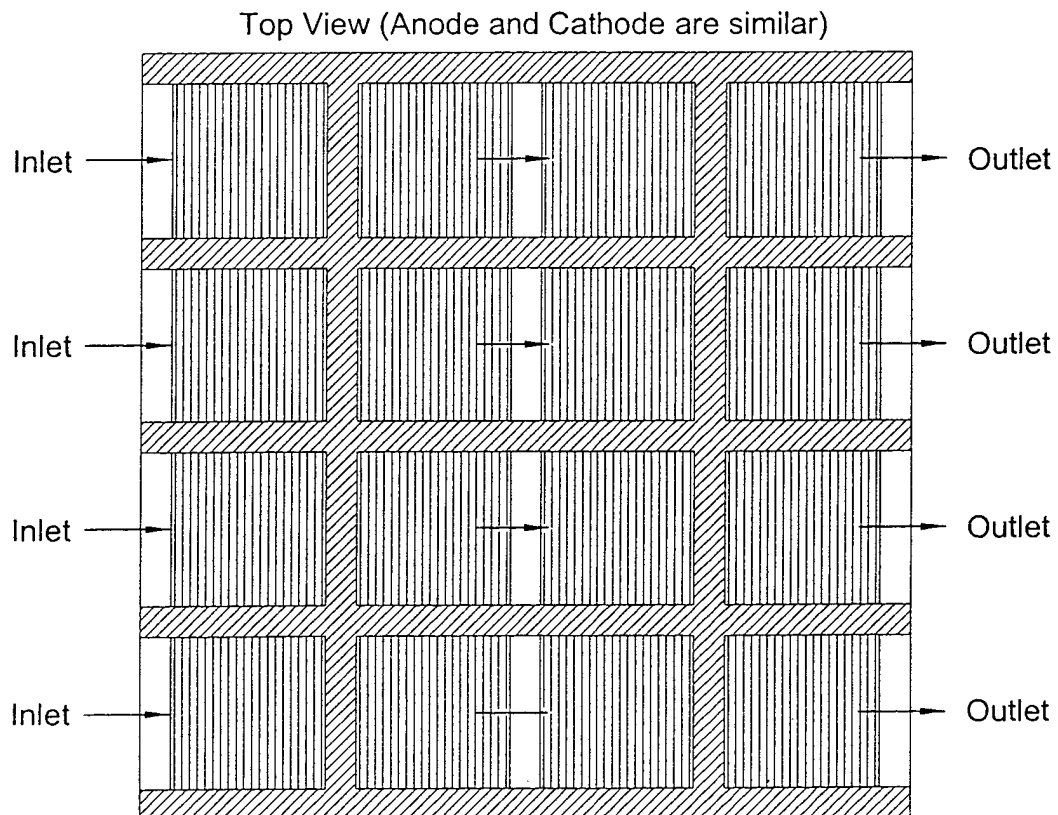
-  Substrate
-  Flow Channel
-  Sol-gel
-  Electrolyte
-  Methanol Barrier Layer

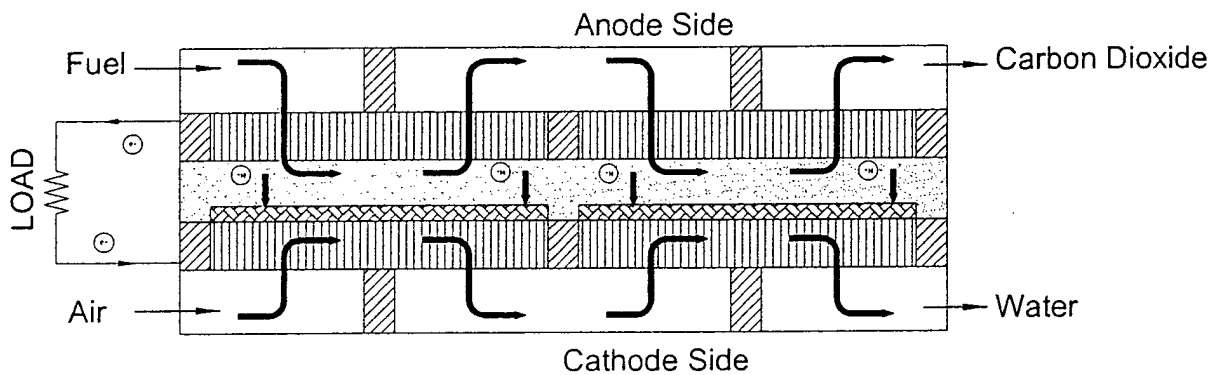
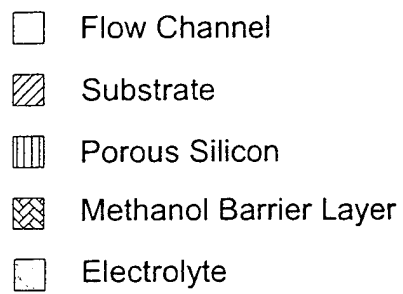
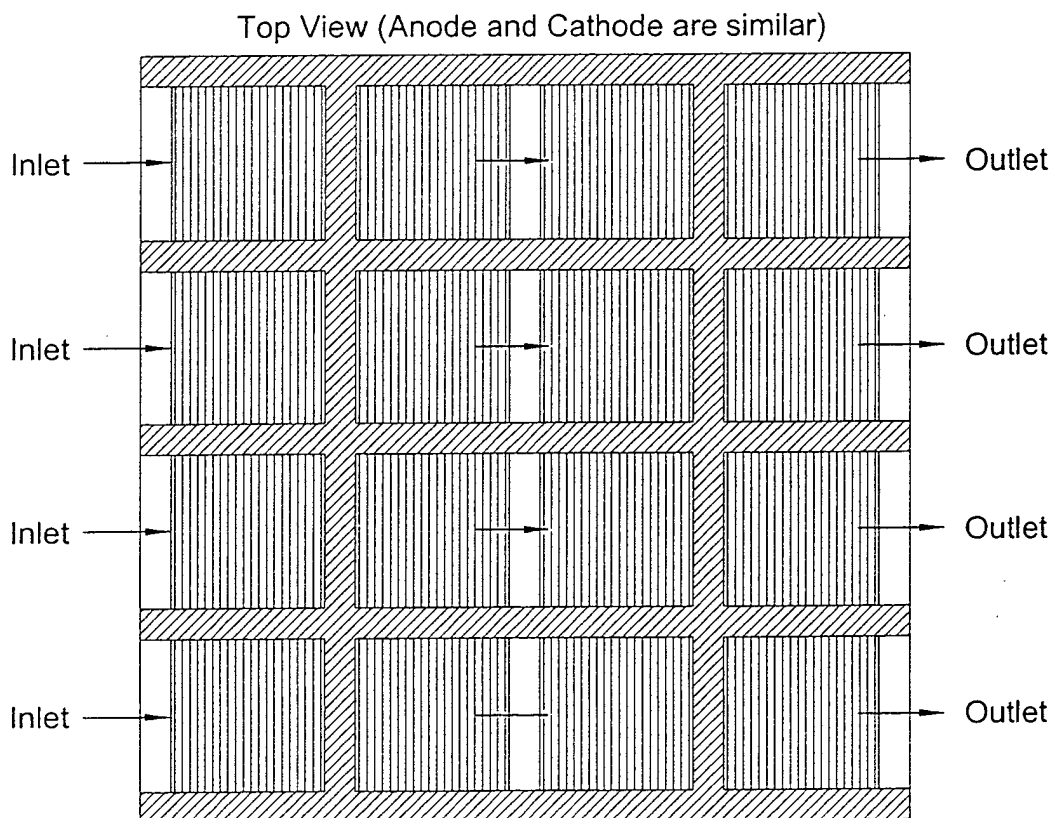
*Fig. 10A*







Top View (Anode and Cathode are similar)

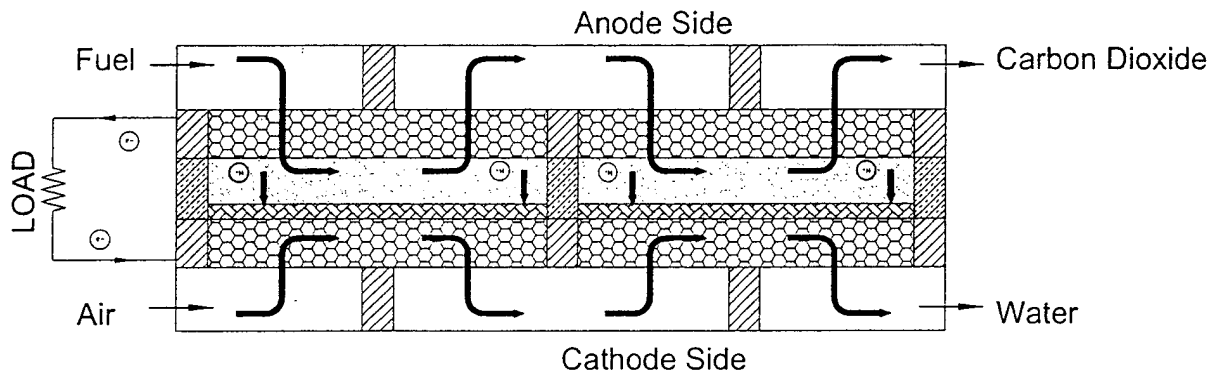


*Fig. 10B*

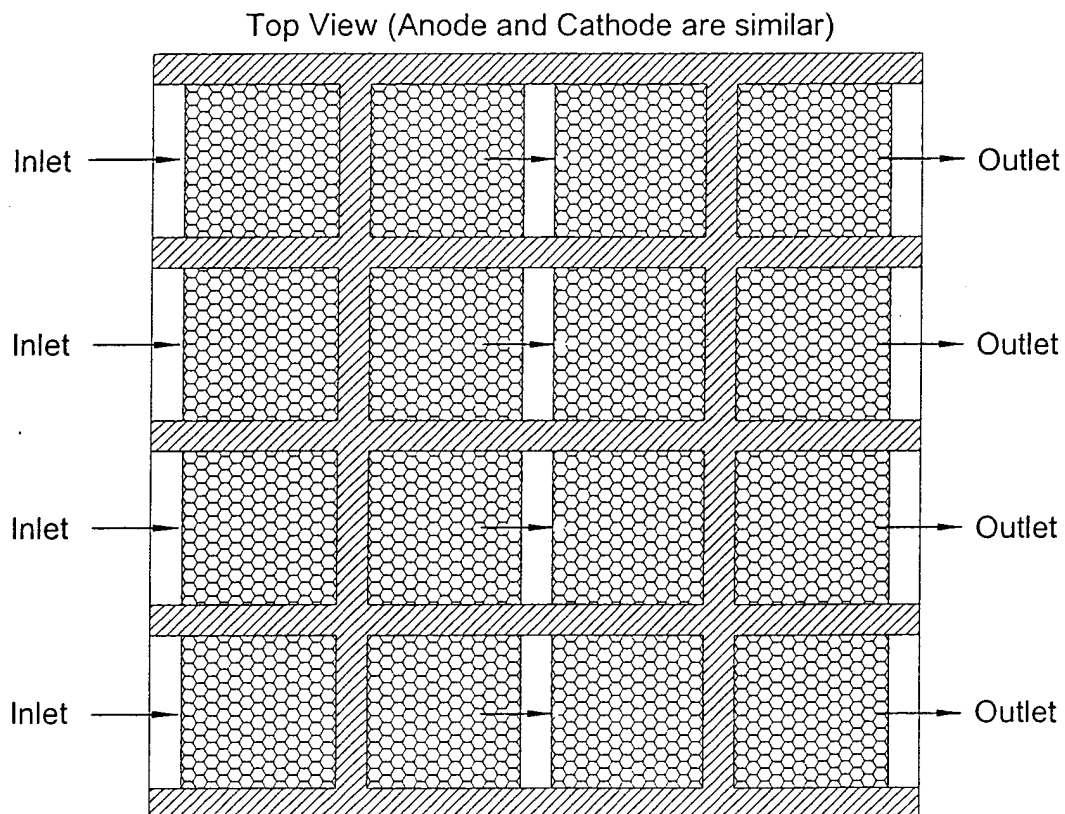
*Fig. 11A**Fig. 11B*

*Fig. 12A**Fig. 12B*






-  Flow Channel
-  Substrate
-  Sol-gel
-  Methanol Barrier Layer
-  Wafer Bonding Material
-  Electrolyte

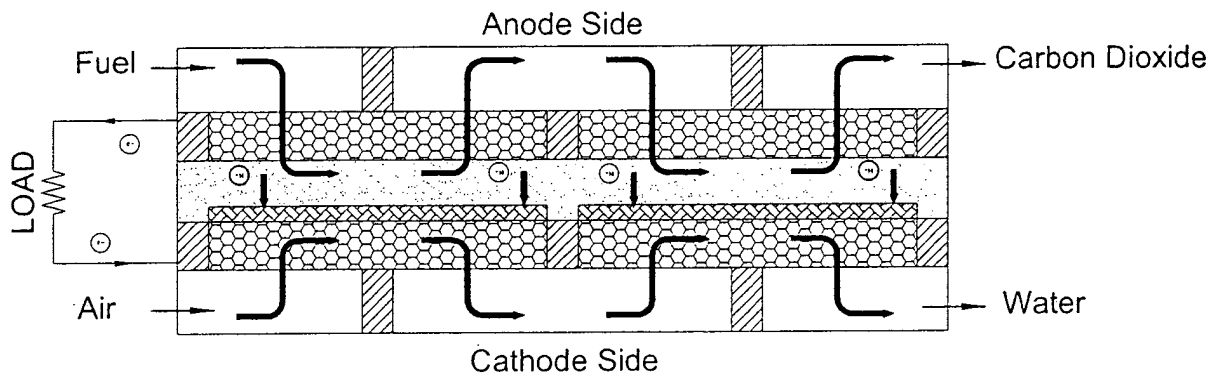
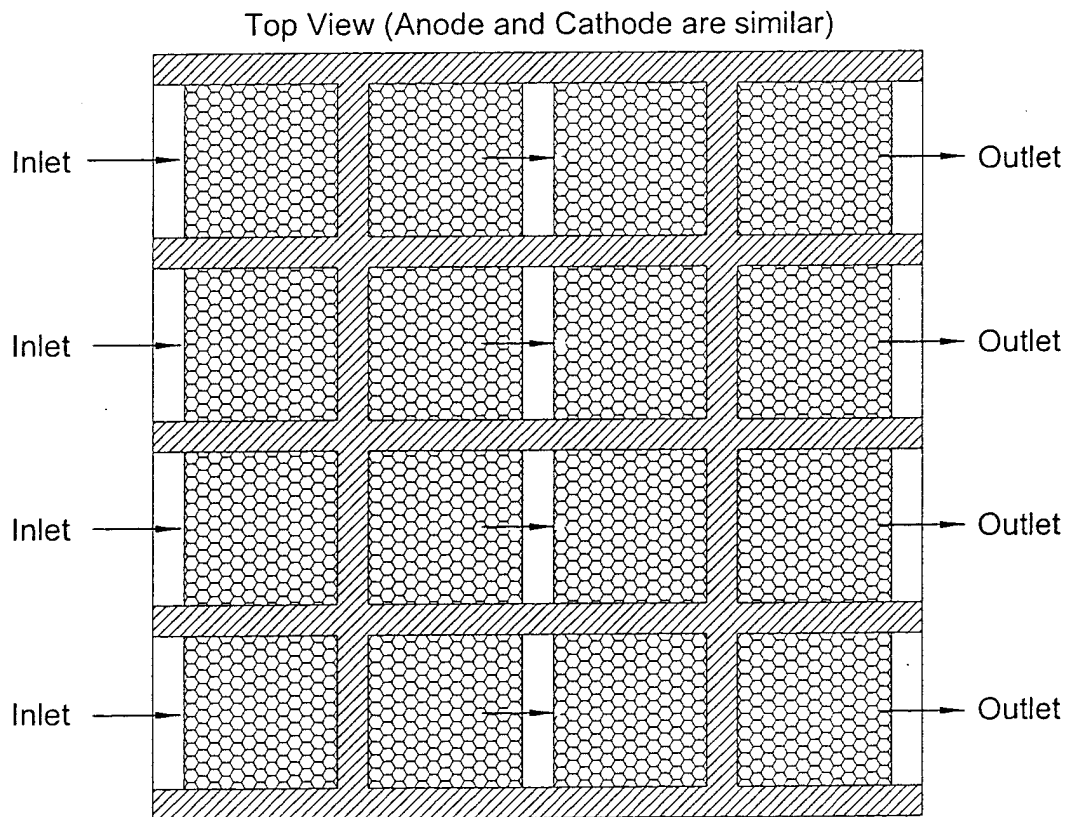


*Fig. 13A*

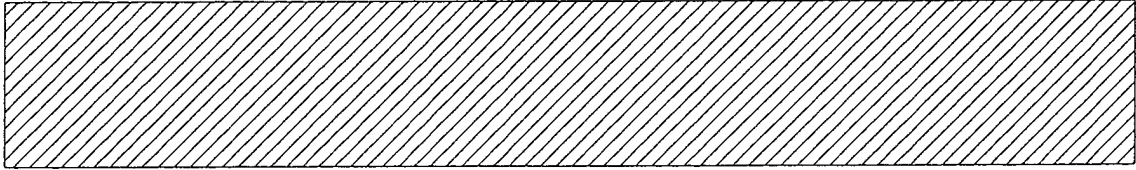


*Fig. 13B*

-  Flow Channel
-  Substrate
-  Sol-gel
-  Methanol Barrier Layer
-  Electrolyte

*Fig. 14A**Fig. 14B*

Side 1 (S1)

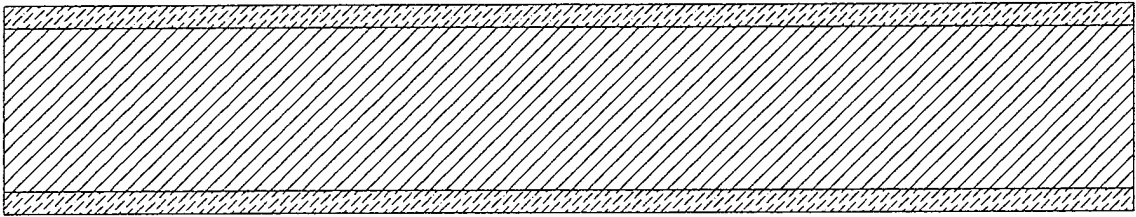


Side 2 (S2)



Substrate

*Fig. 15*

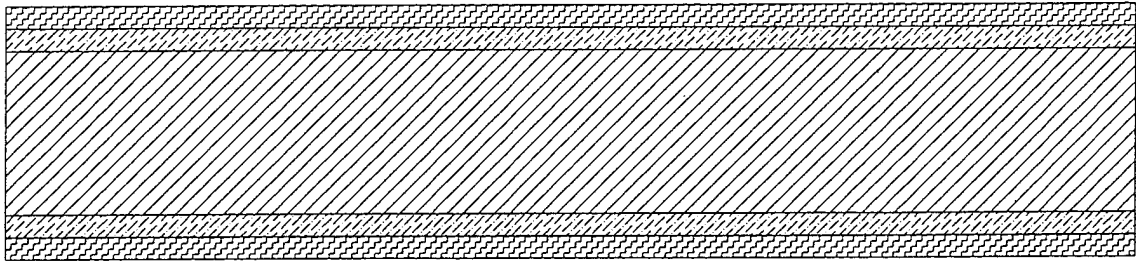


Silicon Nitride



Substrate

*Fig. 16*



Silicon Nitride



Substrate

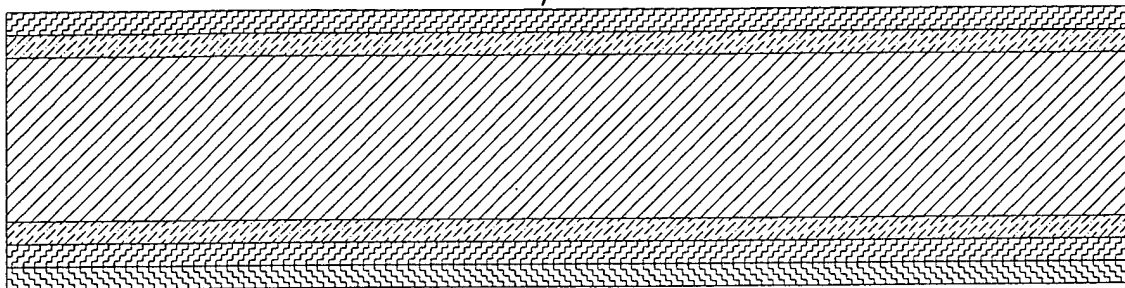






Hexamethyldilazane

*Fig. 17*

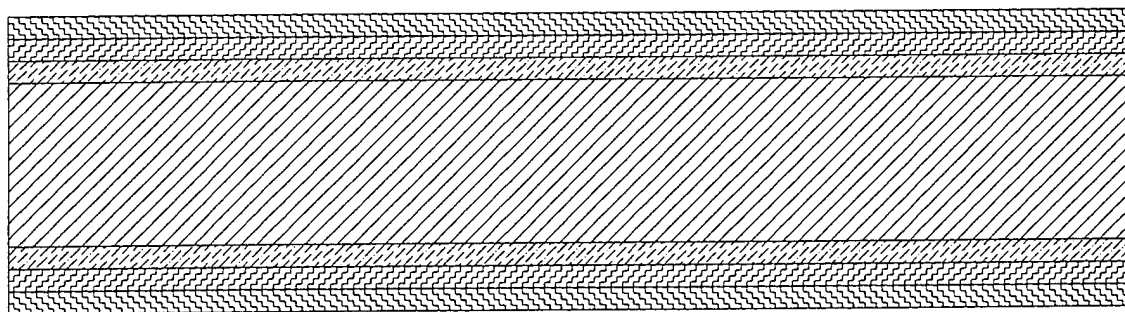






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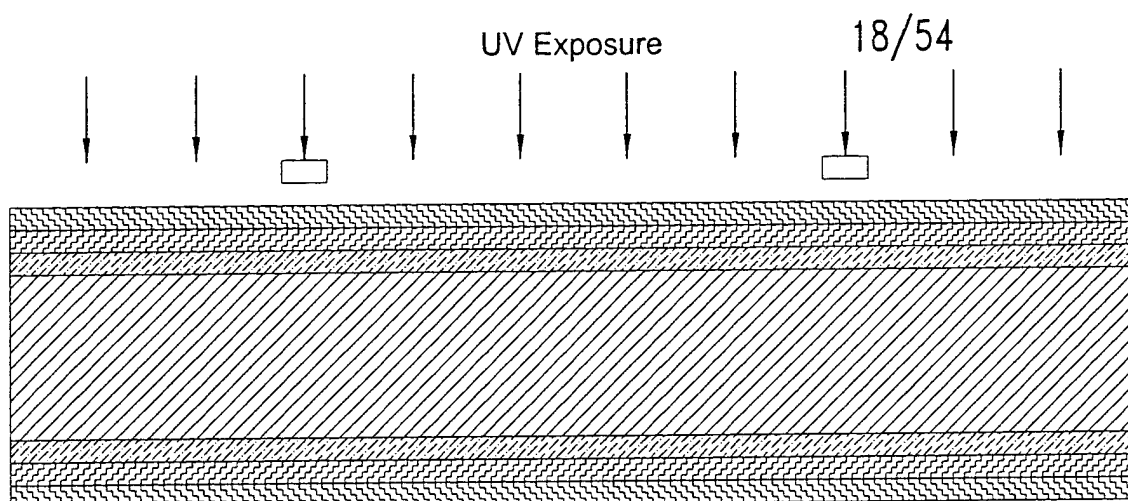
-  Silicon Nitride
-  Substrate
-  Hexamethyldilazane
-  Photoresist





*Fig. 18*



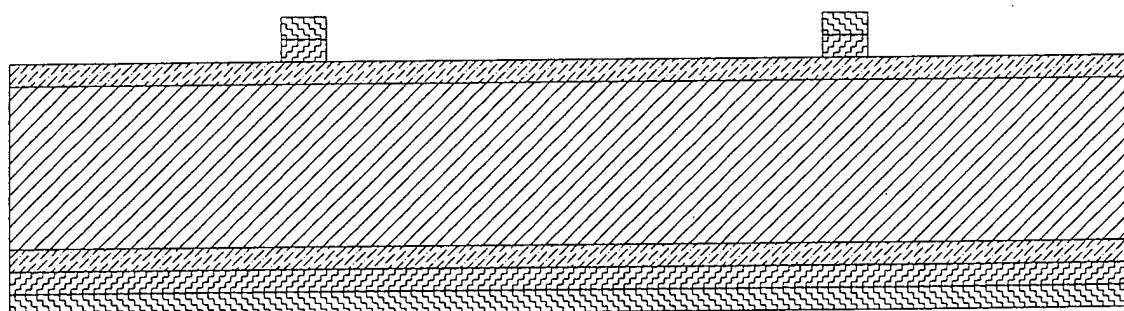
-  Silicon Nitride
-  Substrate
-  Hexamethyldilazane
-  Photoresist



*Fig. 19*



-  Silicon Nitride
-  Substrate
-  Hexamethyldilazane
-  Photoresist

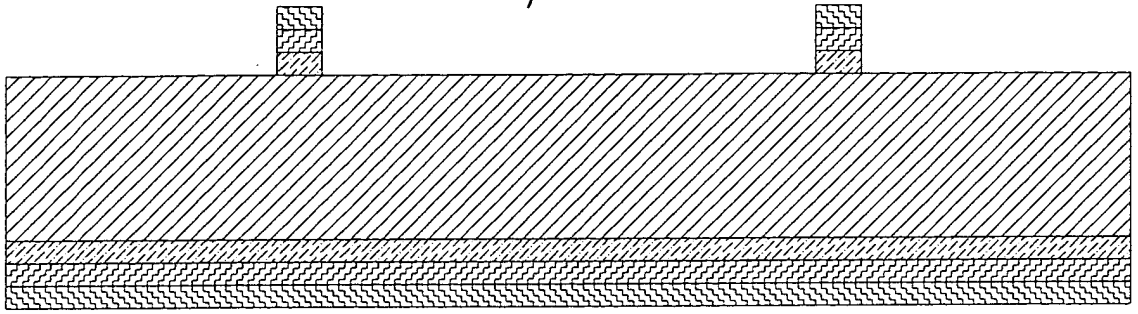
*Fig. 20*







-  Silicon Nitride
-  Substrate
-  Hexamethyldilazane
-  Photoresist

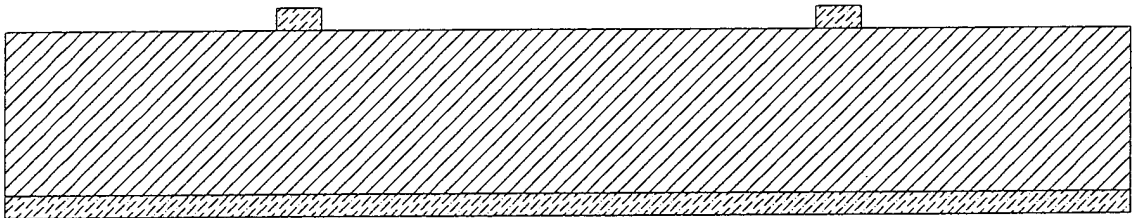
*Fig. 21*



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-  Silicon Nitride
-  Substrate
-  Hexamethyldilazane
-  Photoresist

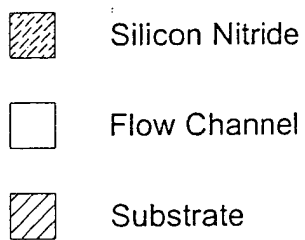
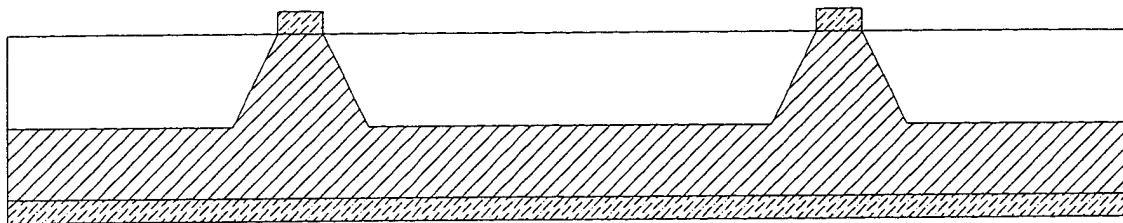
*Fig. 22*



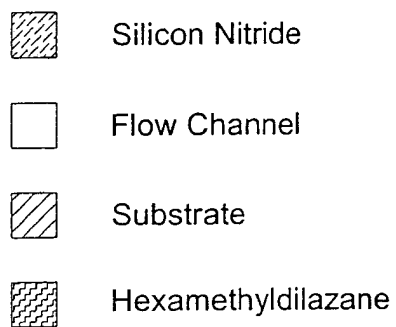
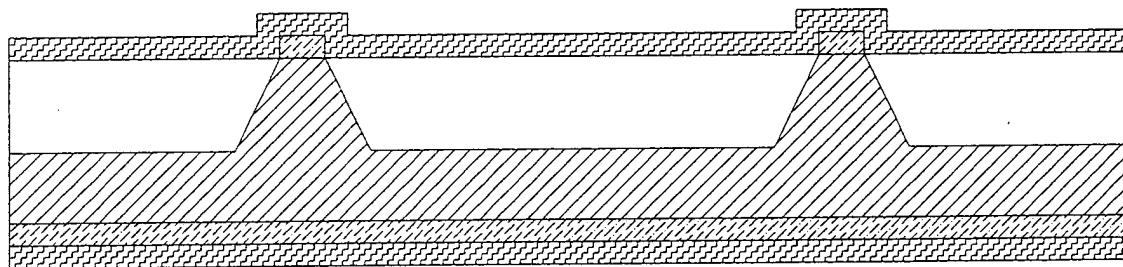
-  Silicon Nitride
-  Substrate

*Fig. 23*

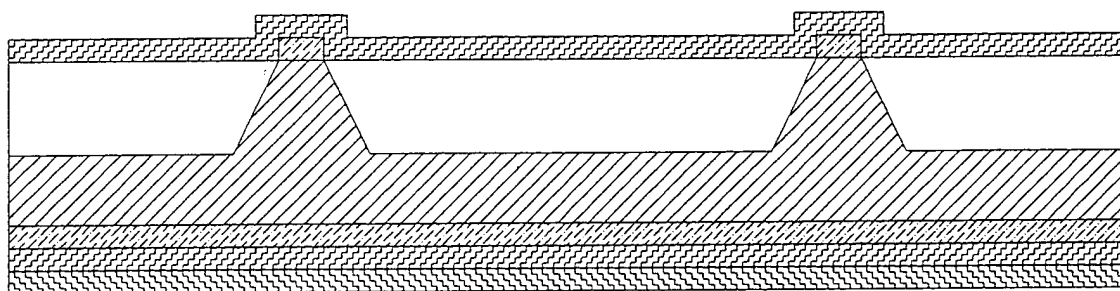
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*Fig. 24*

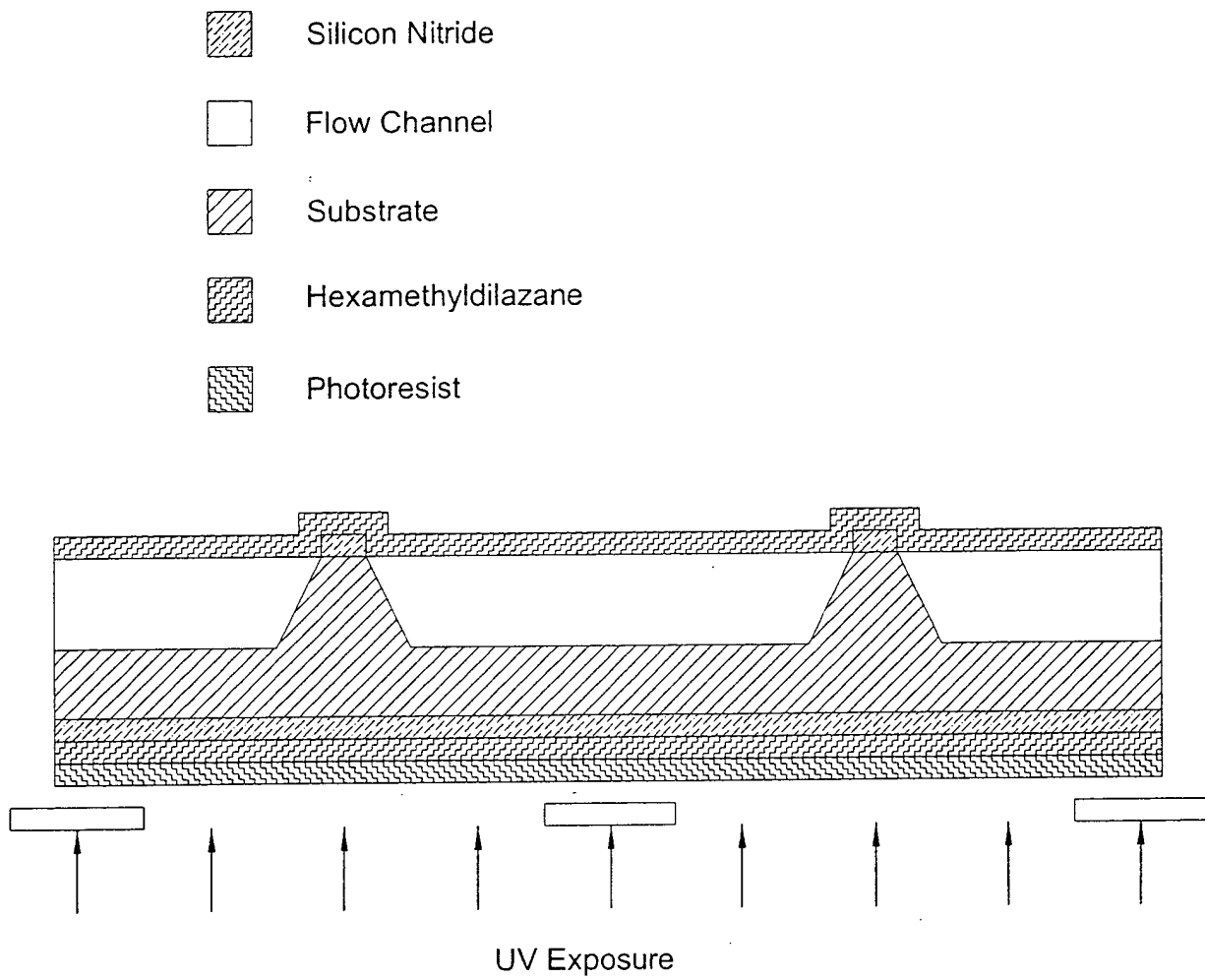


*Fig. 25*



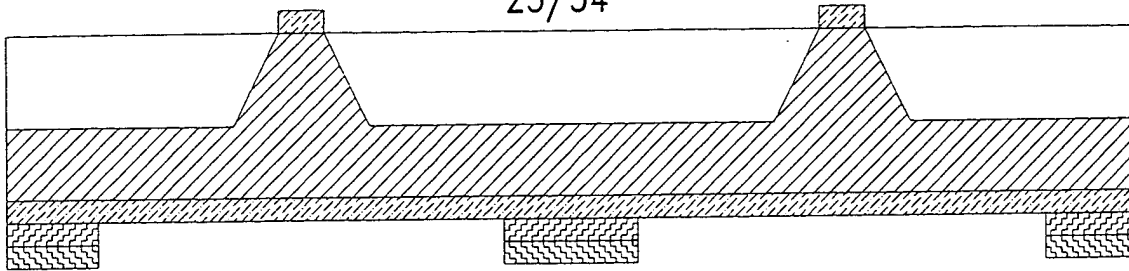
-  Silicon Nitride
-  Flow Channel
-  Substrate
-  Hexamethyldilazane
-  Photoresist






*Fig. 26*



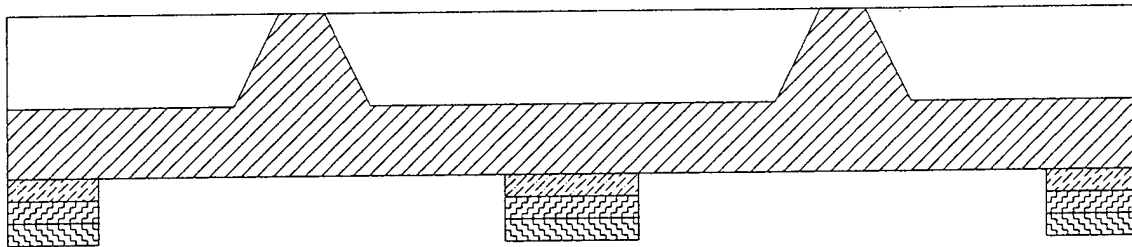
*Fig. 27*






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-  Silicon Nitride
-  Flow Channel
-  Substrate
-  Hexamethyldilazane
-  Photoresist

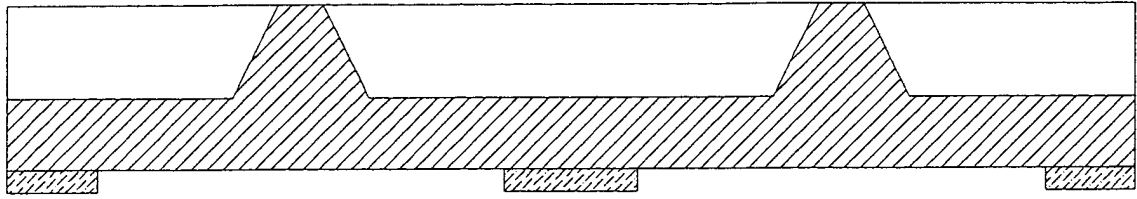
*Fig. 28*






-  Silicon Nitride
-  Flow Channel
-  Substrate
-  Hexamethyldilazane
-  Photoresist

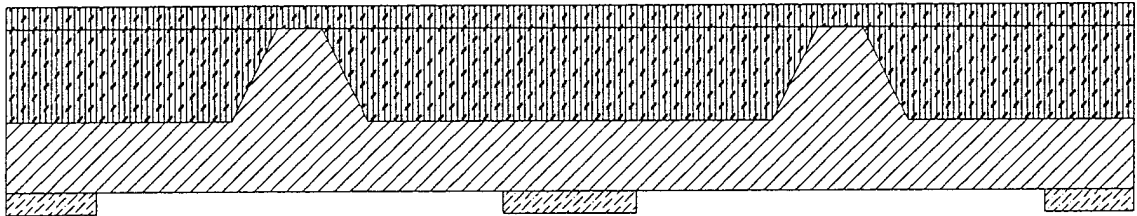
*Fig. 29*





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-  Silicon Nitride
-  Flow Channel
-  Substrate

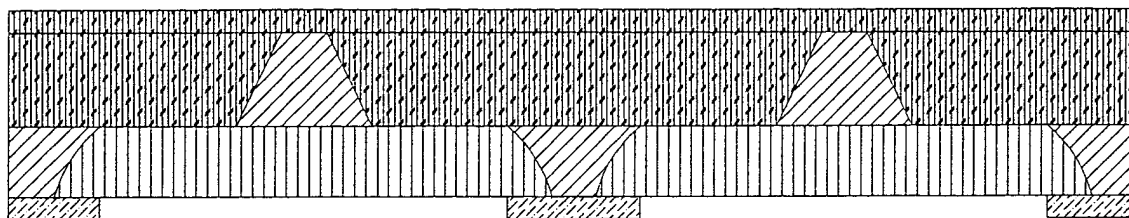
*Fig. 30*








-  Silicon Nitride
-  Flow Channel - Coated with Aluminum
-  Substrate
-  Aluminum Ohmic Contact

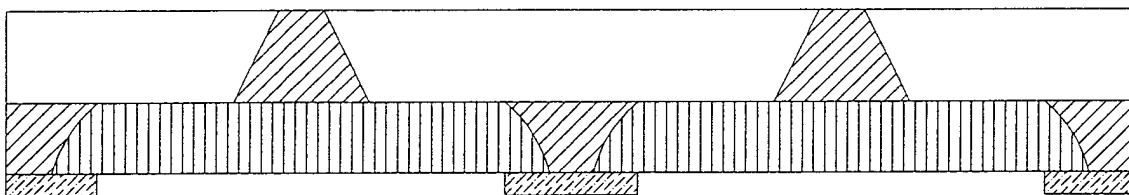
*Fig. 31*









-  Silicon Nitride
-  Flow Channel - Coated with Aluminum
-  Substrate
-  Porous Silicon
-  Aluminum Ohmic Contact

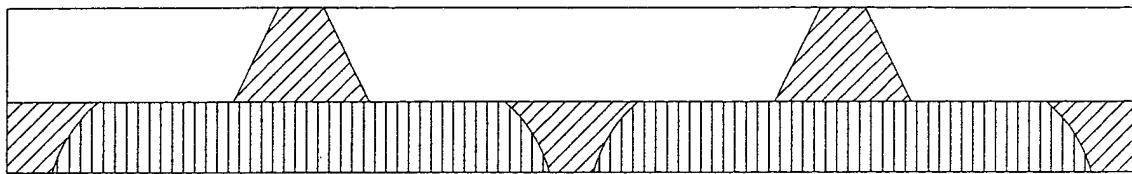
*Fig. 32*






-  Silicon Nitride
-  Flow Channel
-  Substrate
-  Porous Silicon

*Fig. 33*

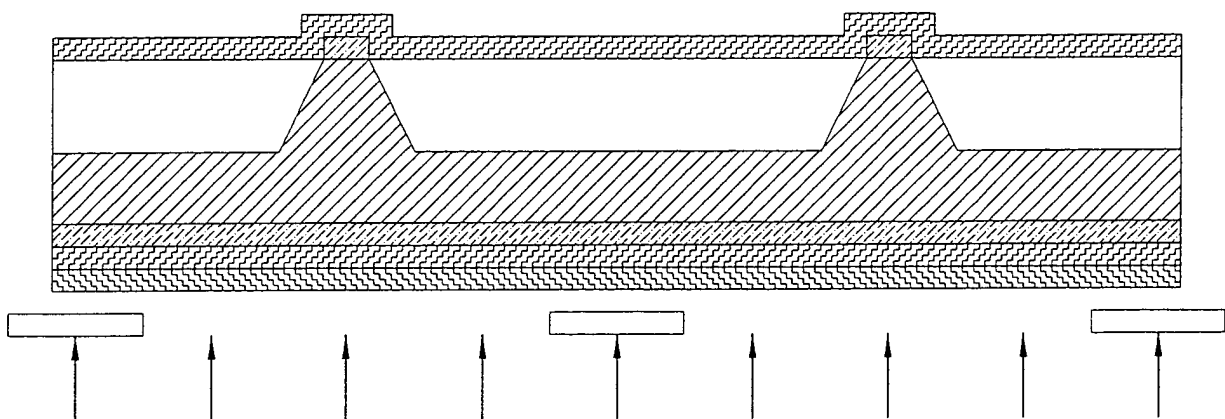
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-  Flow Channel
-  Substrate
-  Porous Silicon

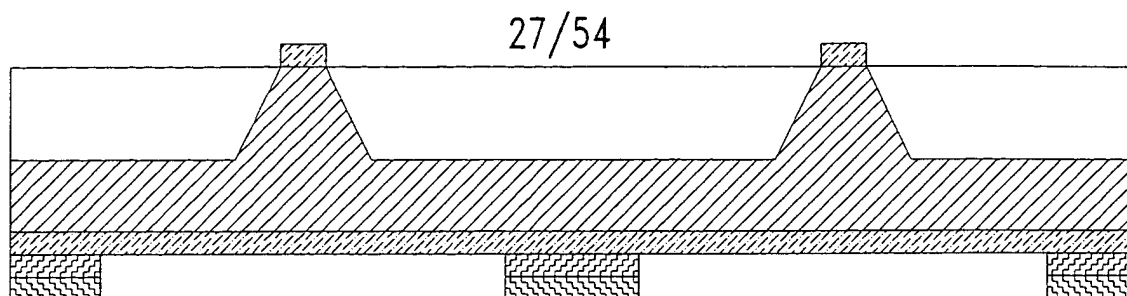
*Fig. 34*






-  Silicon Nitride
-  Flow Channel
-  Substrate
-  Hexamethyldilazane
-  Photoresist



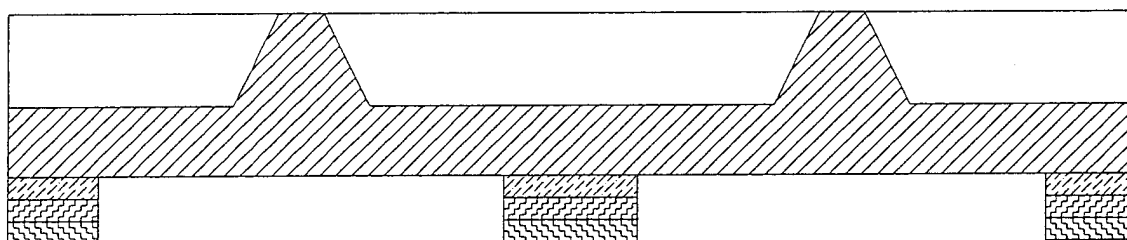
UV Exposure






*Fig. 35*



-  Silicon Nitride
-  Flow Channel
-  Substrate
-  Hexamethyldilazane
-  Photoresist

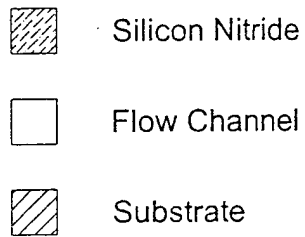
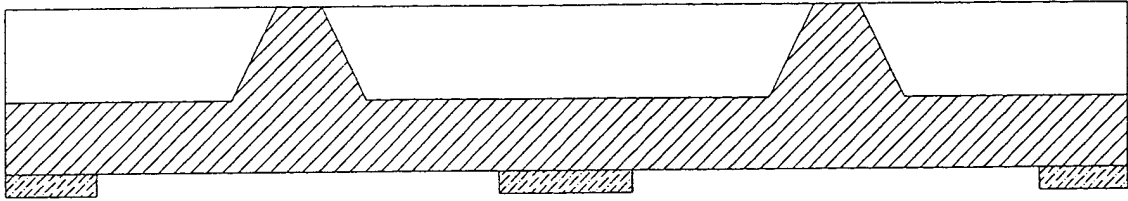
*Fig. 36*



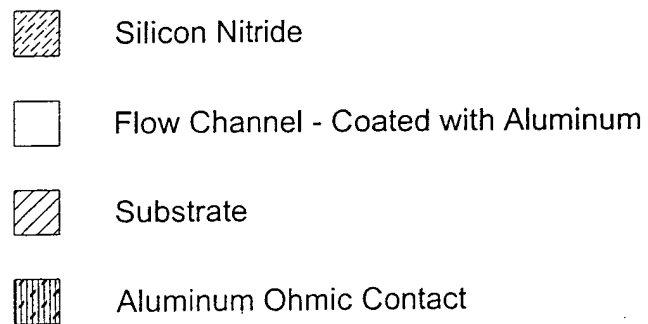
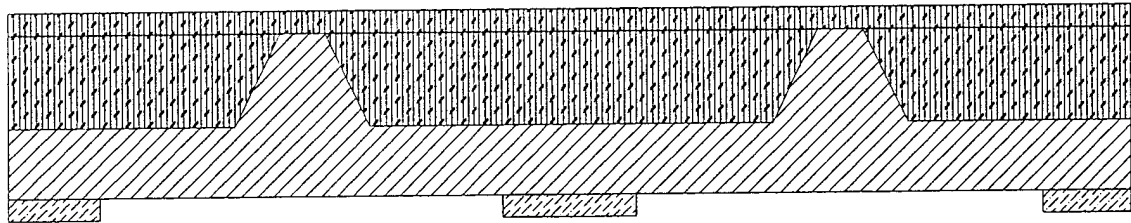
-  Silicon Nitride
-  Flow Channel
-  Substrate
-  Hexamethyldilazane
-  Photoresist

*Fig. 37*

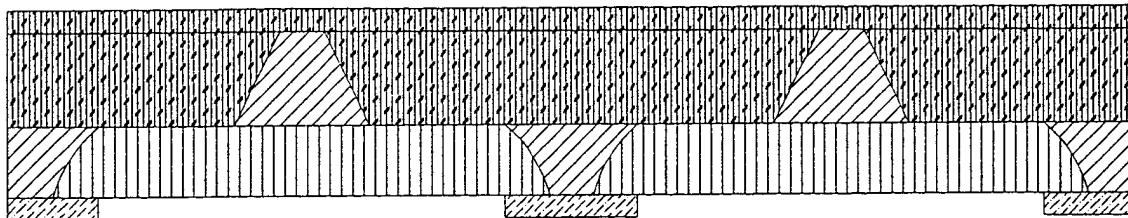
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*Fig. 38*

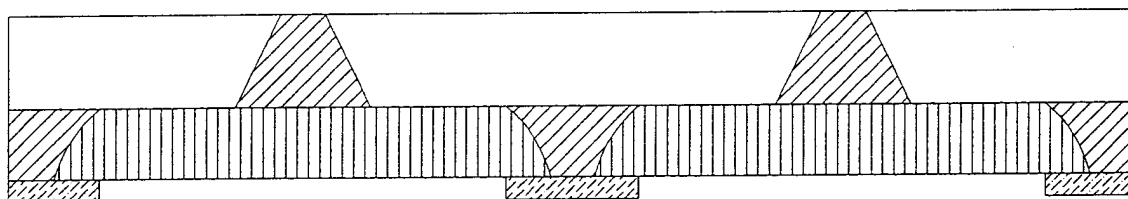






*Fig. 39*



-  Silicon Nitride
-  Flow Channel - Coated with Aluminum
-  Substrate
-  Porous Silicon
-  Aluminum Ohmic Contact

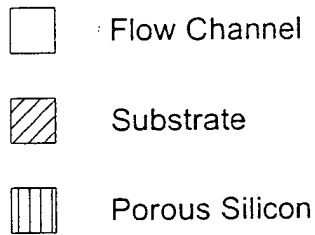
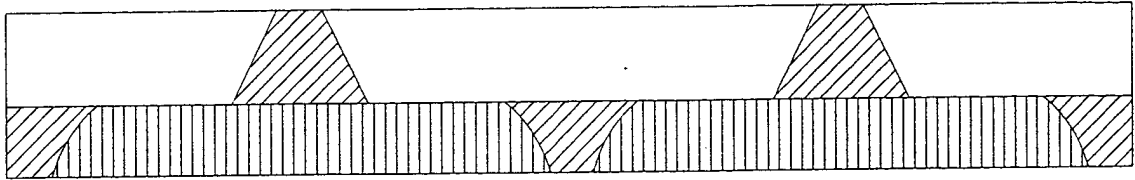
*Fig. 40*



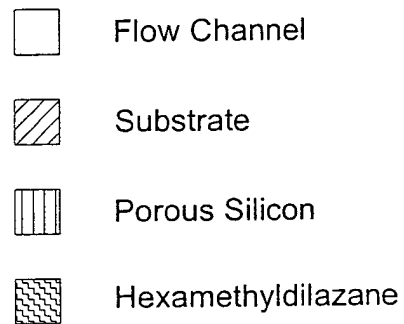
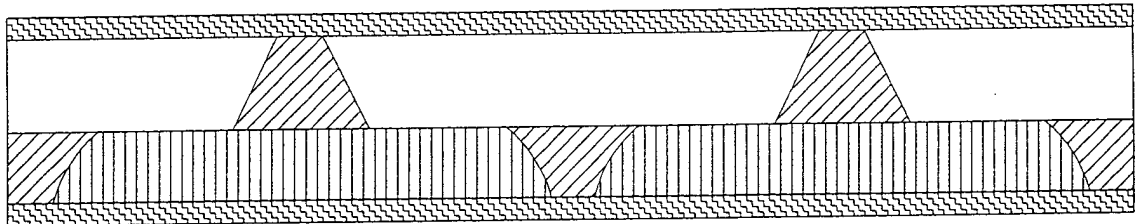
-  Silicon Nitride
-  Flow Channel
-  Substrate
-  Porous Silicon

*Fig. 41*

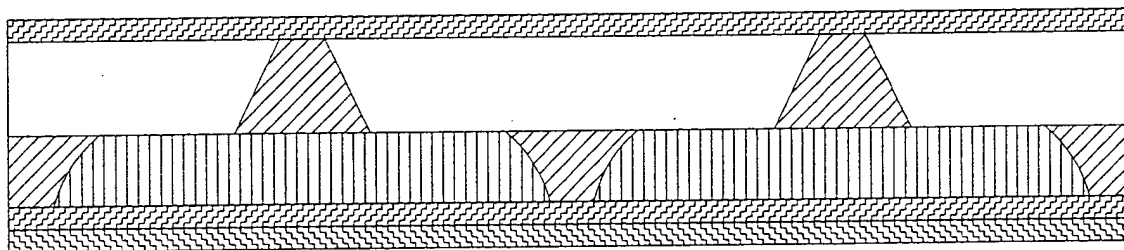
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*Fig. 42*

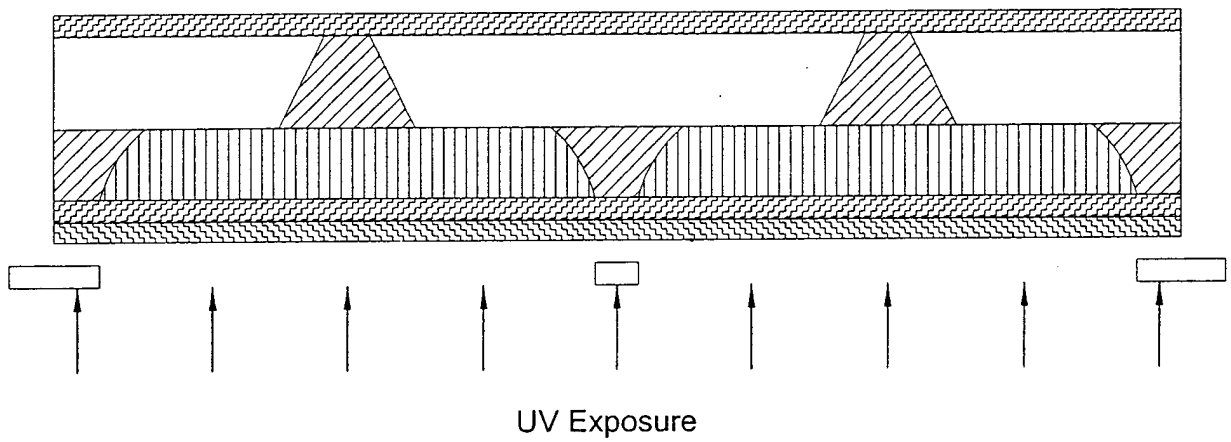
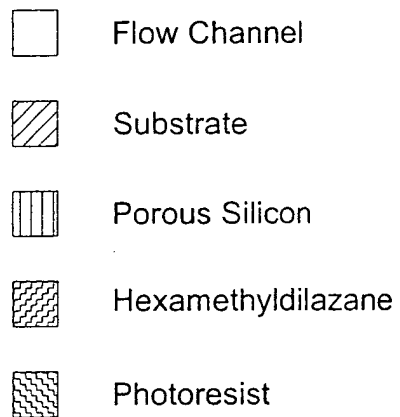


*Fig. 43*

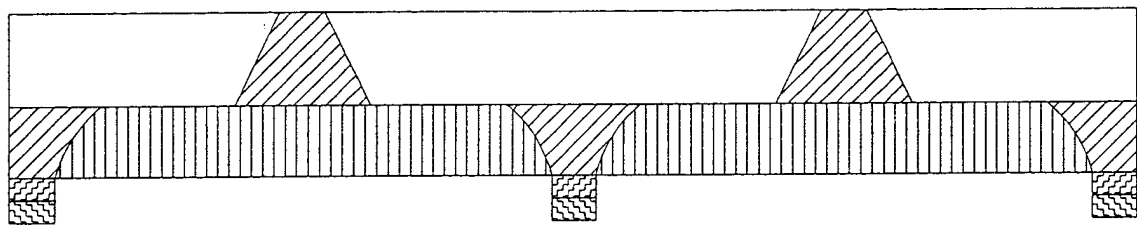







-  Flow Channel
-  Substrate
-  Porous Silicon
-  Hexamethyldilazane
-  Photoresist

*Fig. 44*

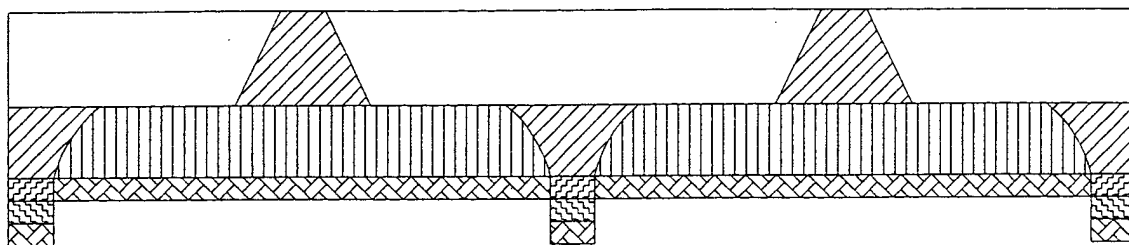
*Fig. 45*









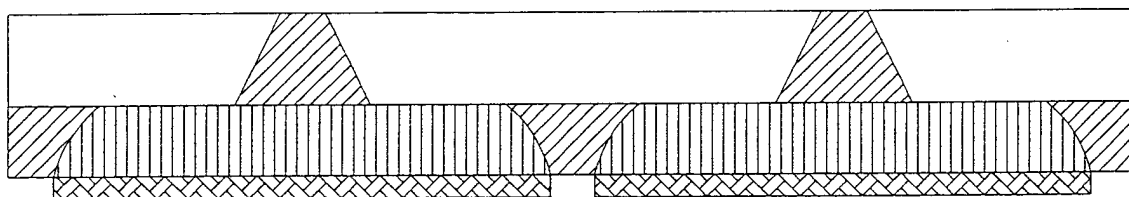
-  Flow Channel
-  Substrate
-  Porous Silicon
-  Hexamethyldilazane
-  Photoresist





*Fig. 46*



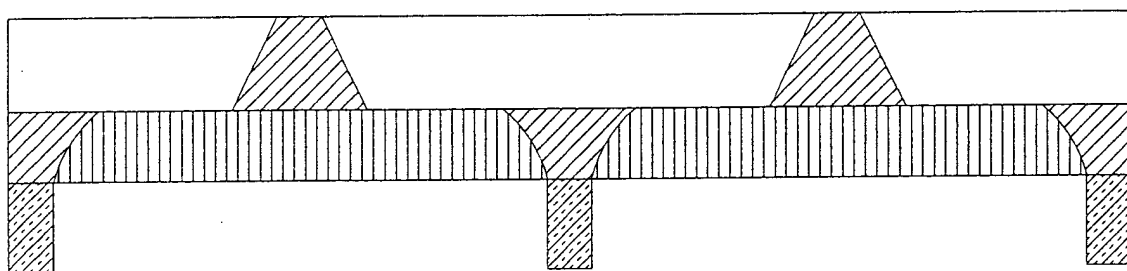
-  Flow Channel
-  Substrate
-  Porous Silicon
-  Hexamethyldilazane
-  Photoresist
-  Methanol Barrier Layer





*Fig. 47*



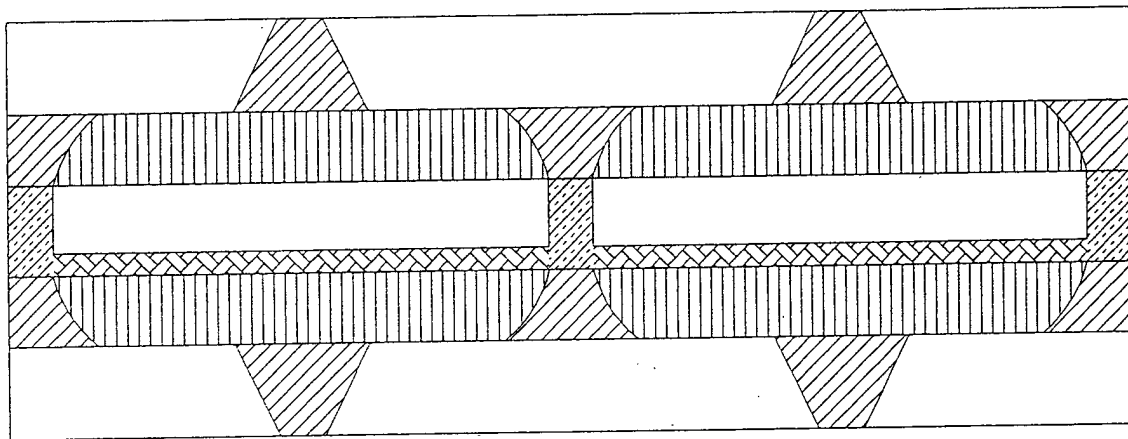
-  Flow Channel
-  Substrate
-  Porous Silicon
-  Methanol Barrier Layer






*Fig. 48*



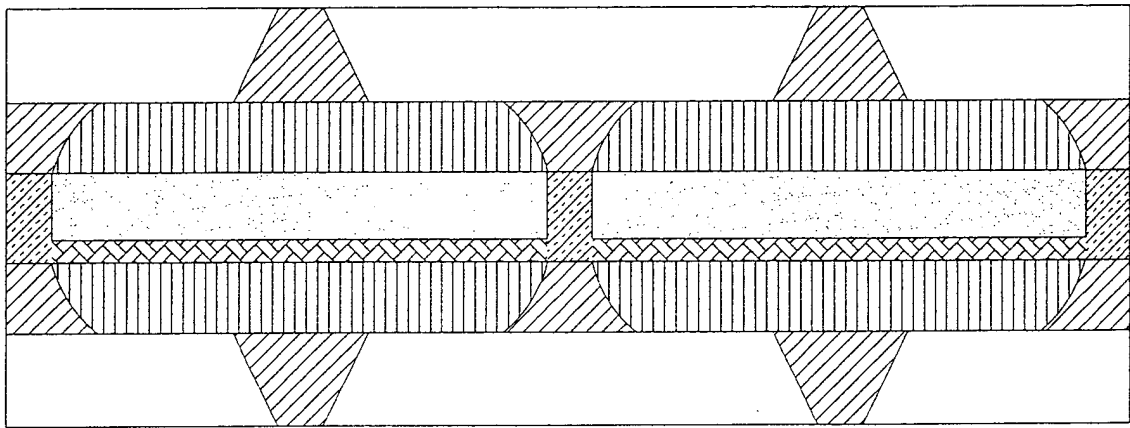
-  Flow Channel
-  Substrate
-  Porous Silicon
-  Wafer Bonding Material







*Fig. 49*



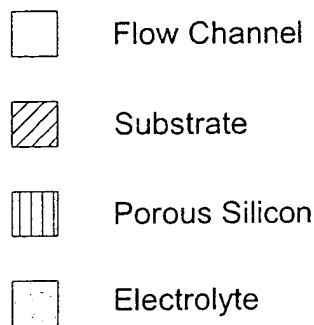
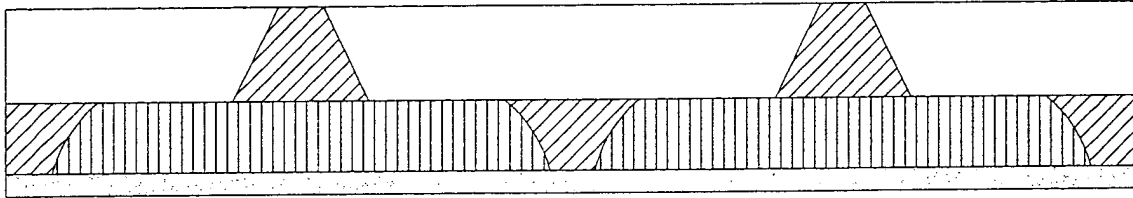
-  Flow Channel
-  Substrate
-  Porous Silicon
-  Methanol Barrier Layer
-  Wafer Bonding Material

*Fig. 50*

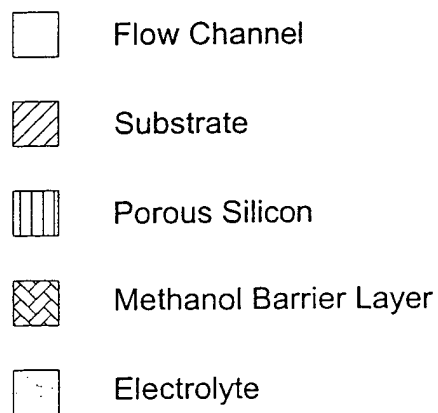
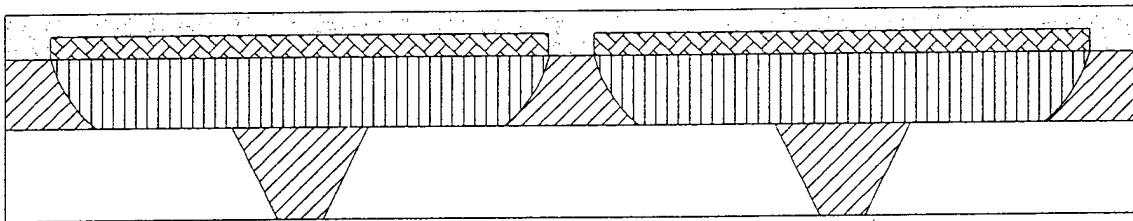


-  Flow Channel
-  Substrate
-  Porous Silicon
-  Methanol Barrier Layer
-  Wafer Bonding Material
-  Electrolyte

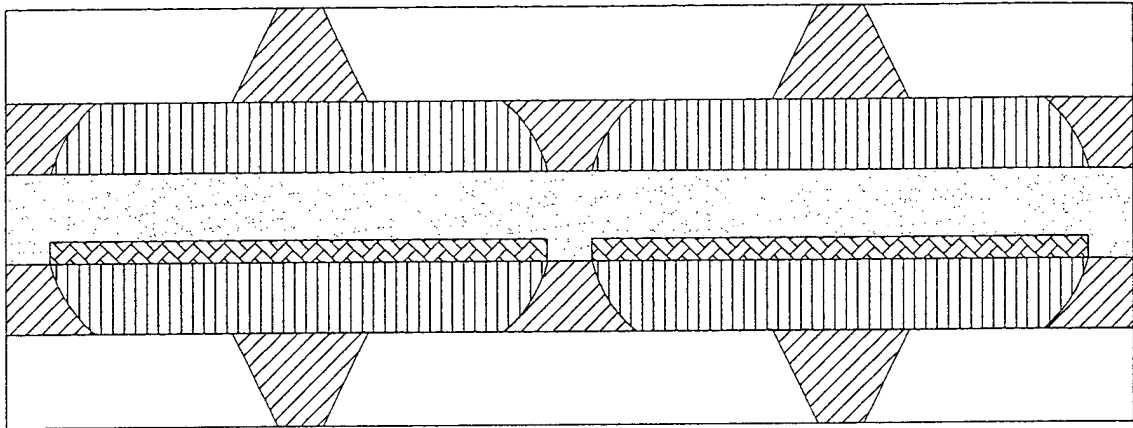
*Fig. 51*








*Fig. 52*

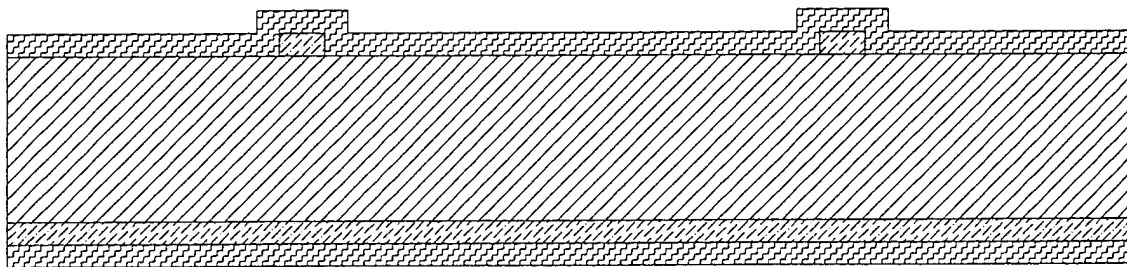





*Fig. 53*

*Fig. 54*

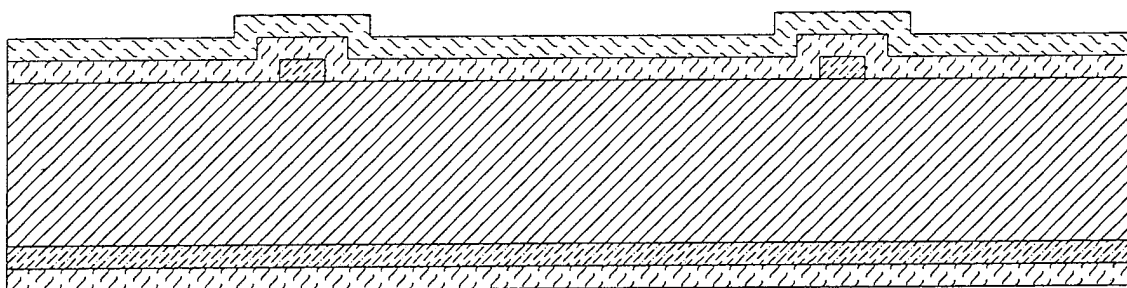
-  Flow Channel
-  Substrate
-  Porous Silicon
-  Methanol Barrier Layer
-  Electrolyte





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-  Silicon Nitride
-  Substrate
-  Hexamethyldilazane

*Fig. 55*

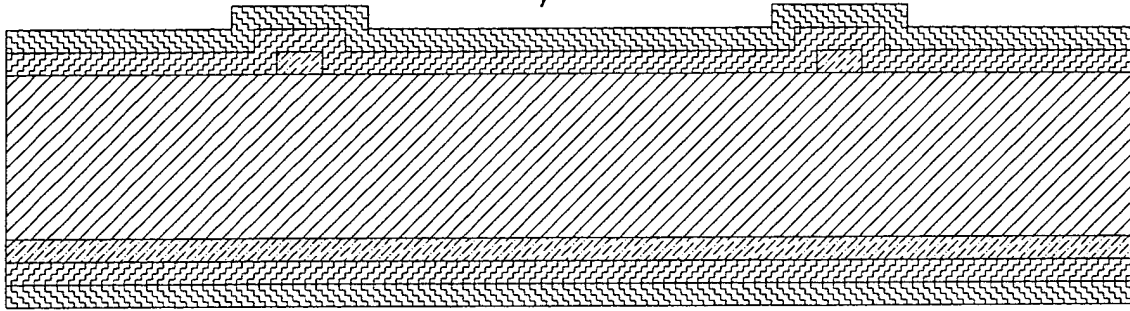






-  Silicon Nitride
-  Substrate
-  Hexamethyldilazane
-  Photoresist

*Fig. 56*







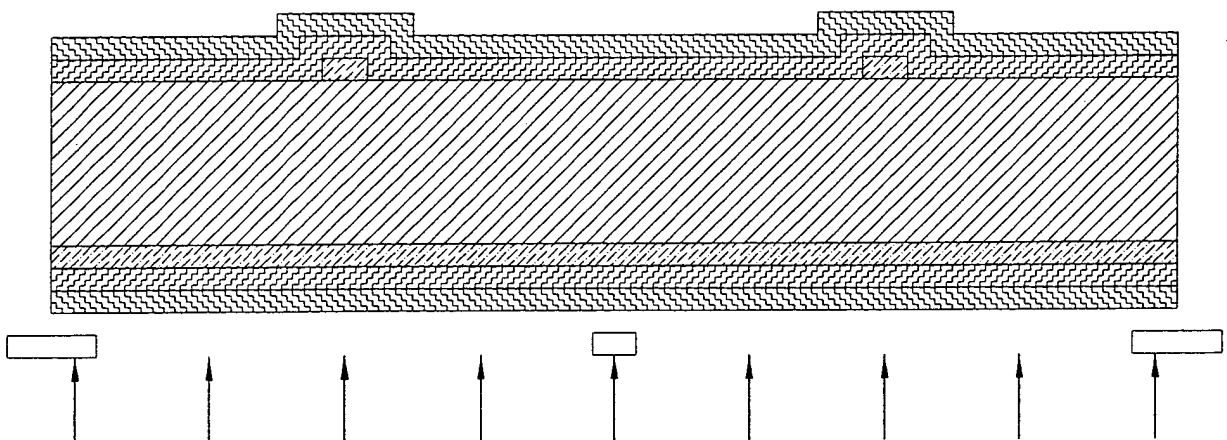
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-  Silicon Nitride
-  Substrate
-  Hexamethyldilazane
-  Photoresist

*Fig. 57*

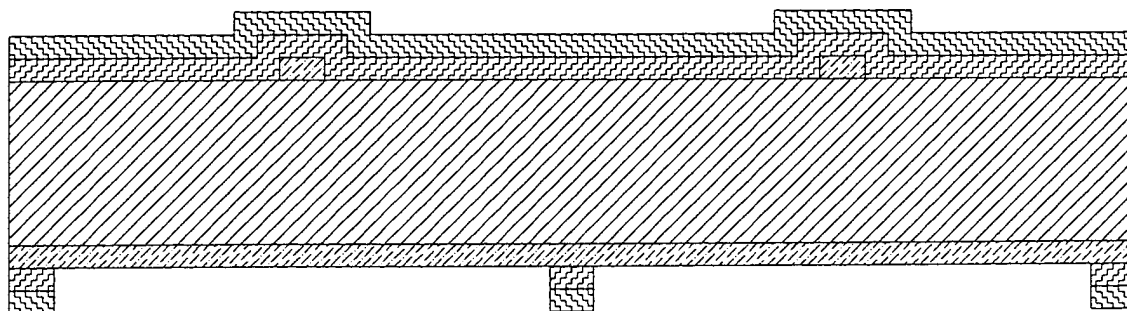
-  Silicon Nitride
-  Substrate
-  Hexamethyldilazane
-  Photoresist





UV Exposure

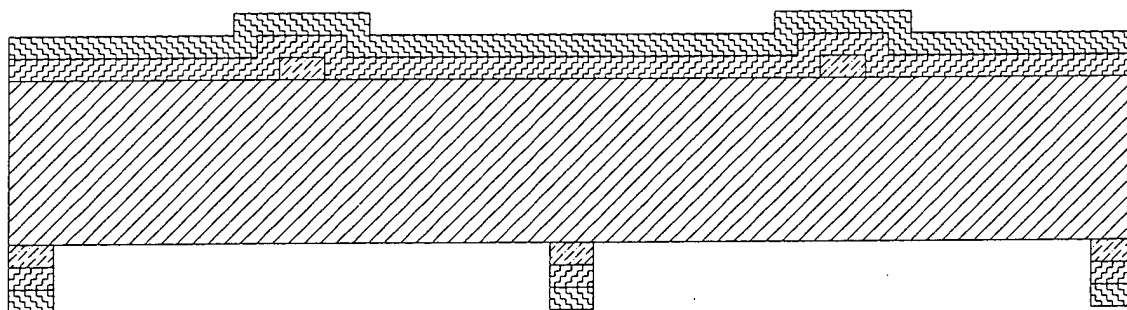
*Fig. 58*





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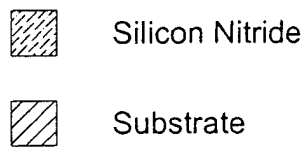
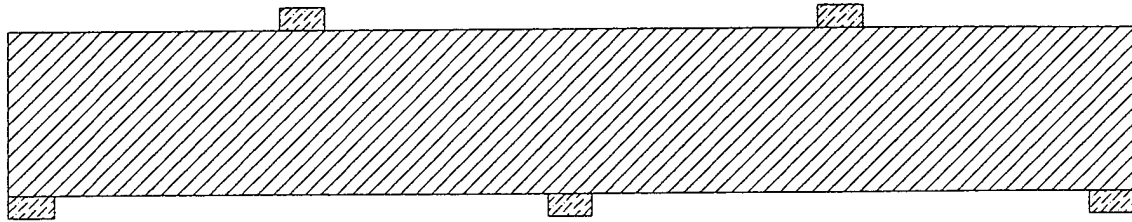
-  Silicon Nitride
-  Substrate
-  Hexamethyldilazane
-  Photoresist

*Fig. 59*

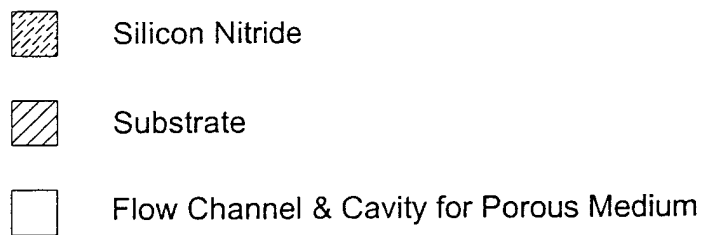
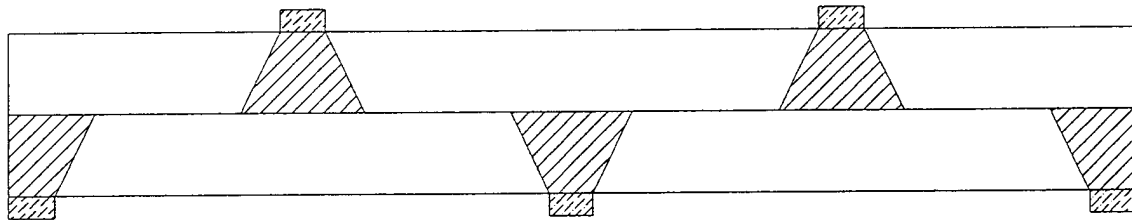


-  Silicon Nitride
-  Substrate
-  Hexamethyldilazane
-  Photoresist

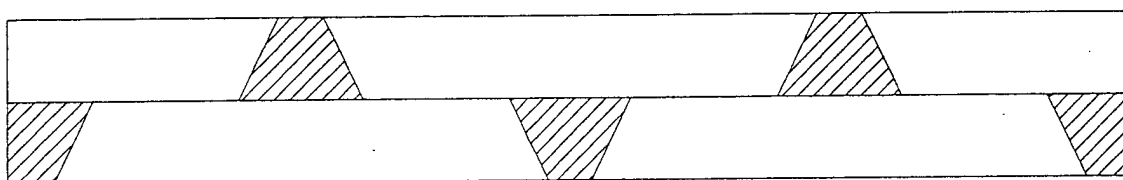
*Fig. 60*



*Fig. 61*



*Fig. 62*

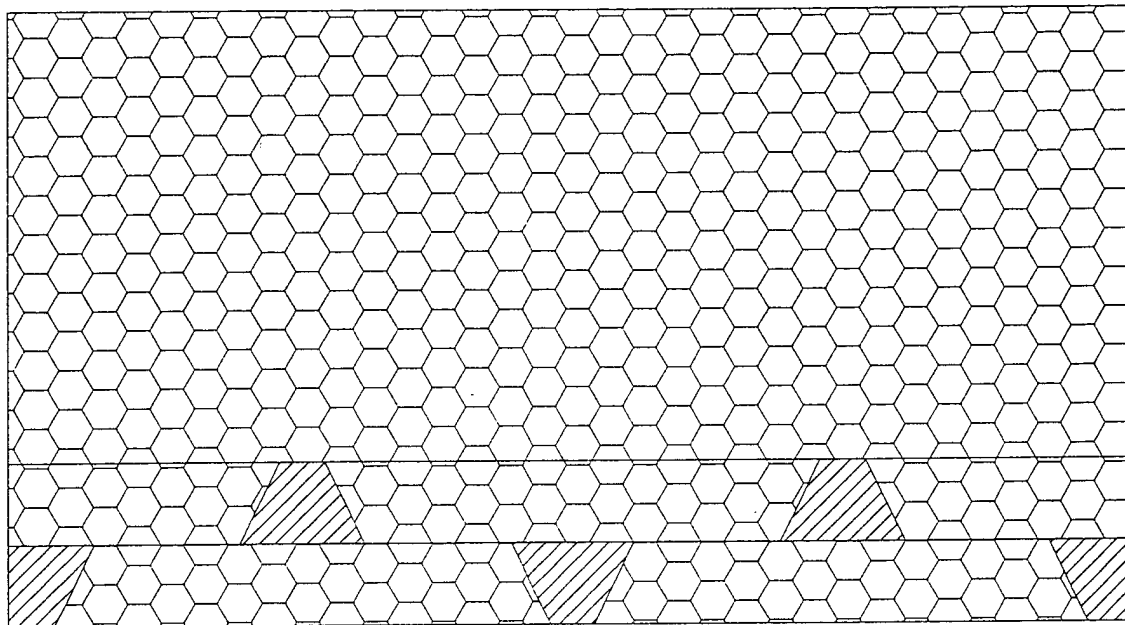





Substrate



Flow Channel & Cavity for Porous Medium

*Fig. 63*

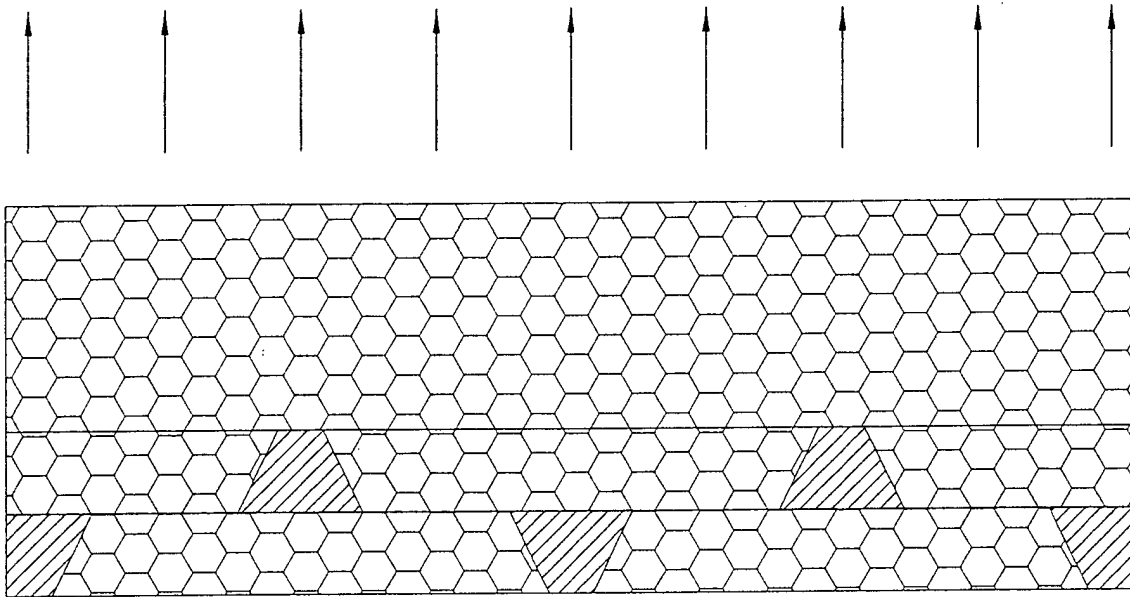


-  Substrate
-  Flow Channel & Cavity for Porous Medium
-  Sol-gel in Solution Form

*Fig. 64*

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Evaporation



Substrate

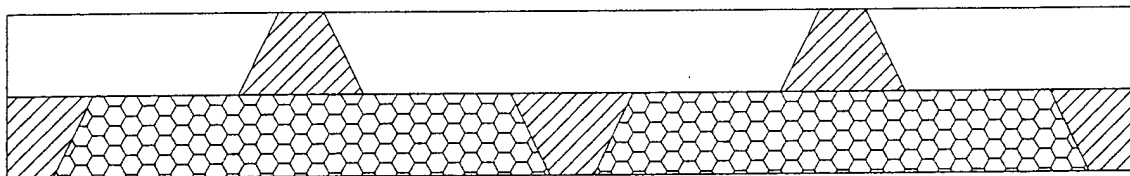


Flow Channel & Cavity for Porous Medium



Sol-gel in Solution Form

*Fig. 65*



Substrate



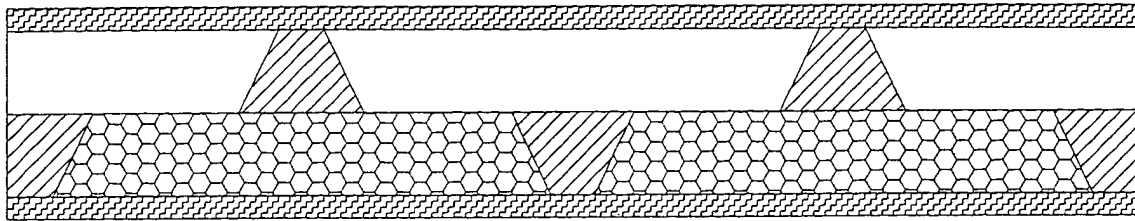
Flow Channel







Sol-gel

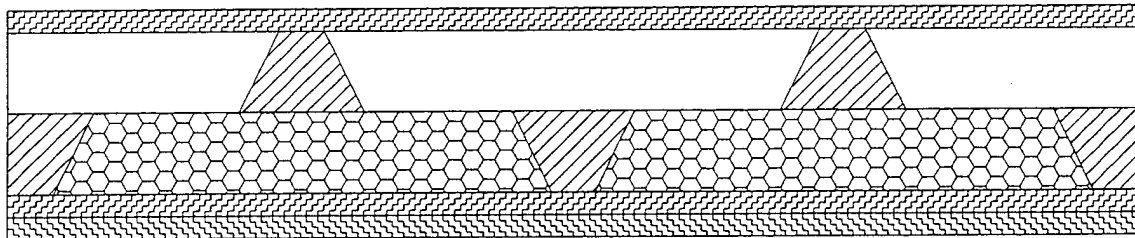
*Fig. 66*






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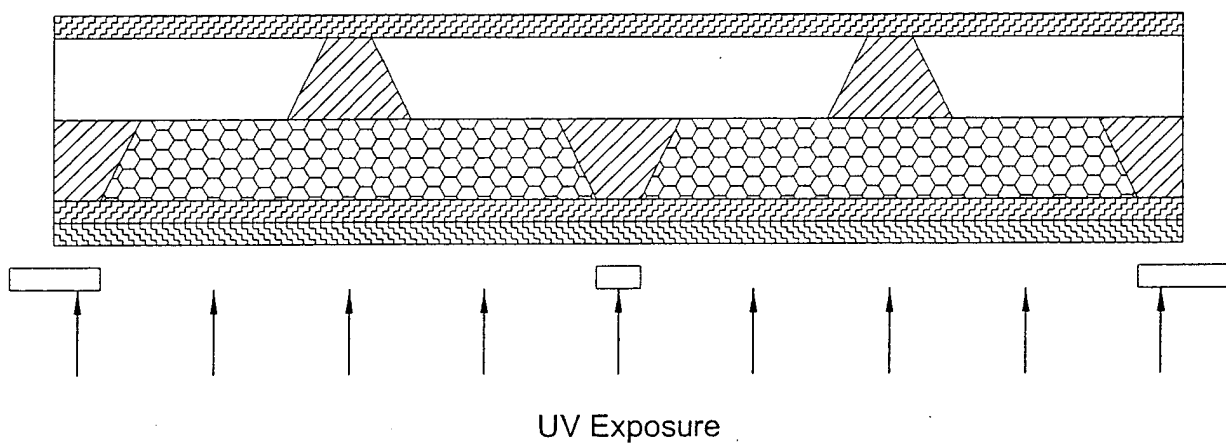
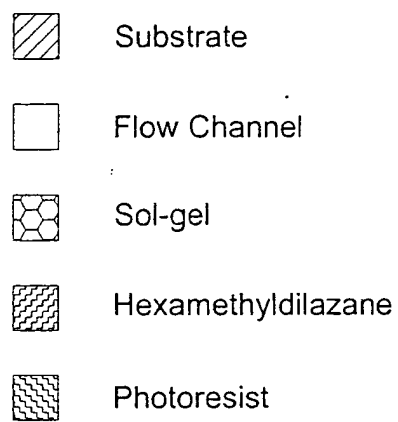
-  Substrate
-  Flow Channel
-  Sol-gel
-  Hexamethyldilazane

*Fig. 67*



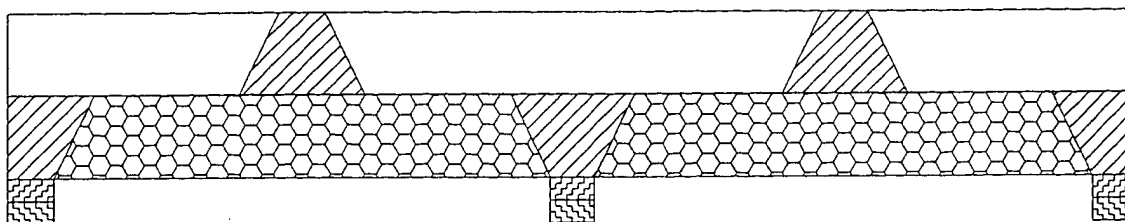
-  Substrate
-  Flow Channel
-  Sol-gel
-  Hexamethyldilazane
-  Photoresist






*Fig. 68*



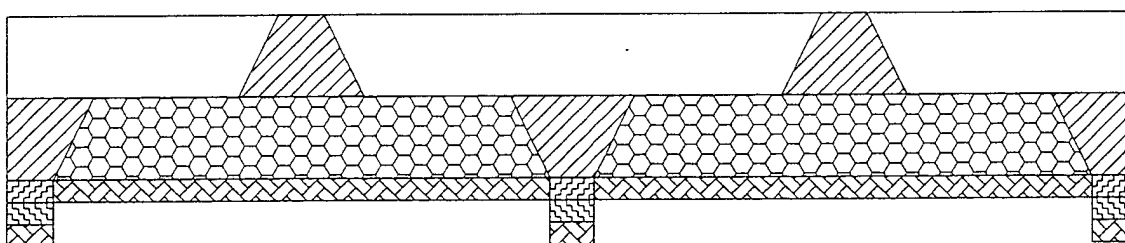
*Fig. 69*











-  Substrate
-  Flow Channel
-  Sol-gel
-  Hexamethyldilazane
-  Photoresist

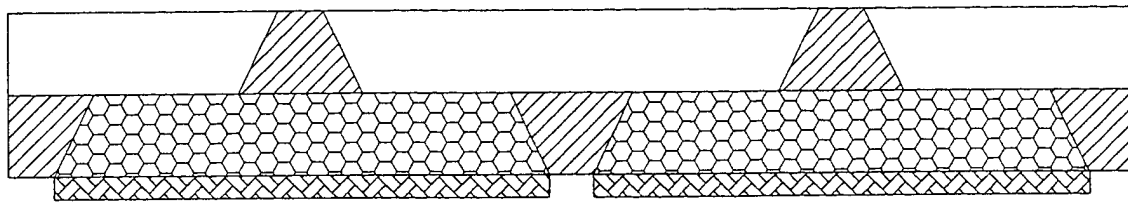
*Fig. 70*







-  Substrate
-  Flow Channel
-  Sol-gel
-  Hexamethyldilazane
-  Photoresist
-  Methanol Barrier Layer

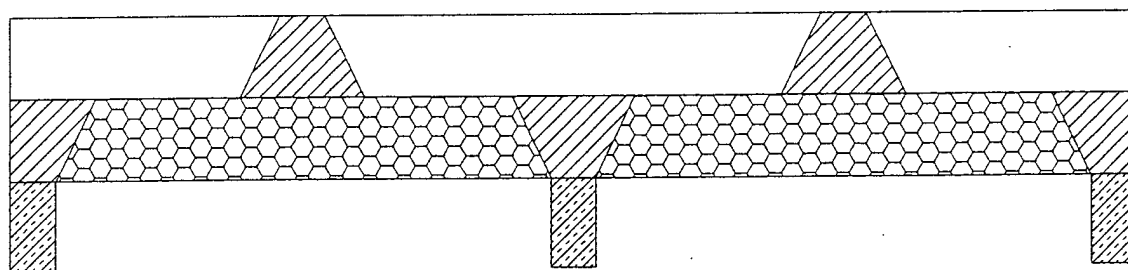
*Fig. 71*





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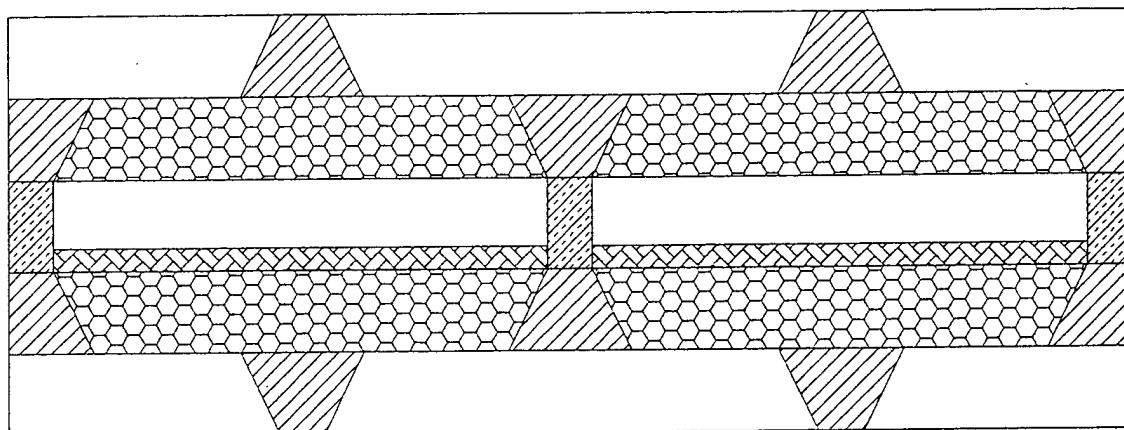
-  Substrate
-  Flow Channel
-  Sol-gel
-  Methanol Barrier Layer






*Fig. 72*



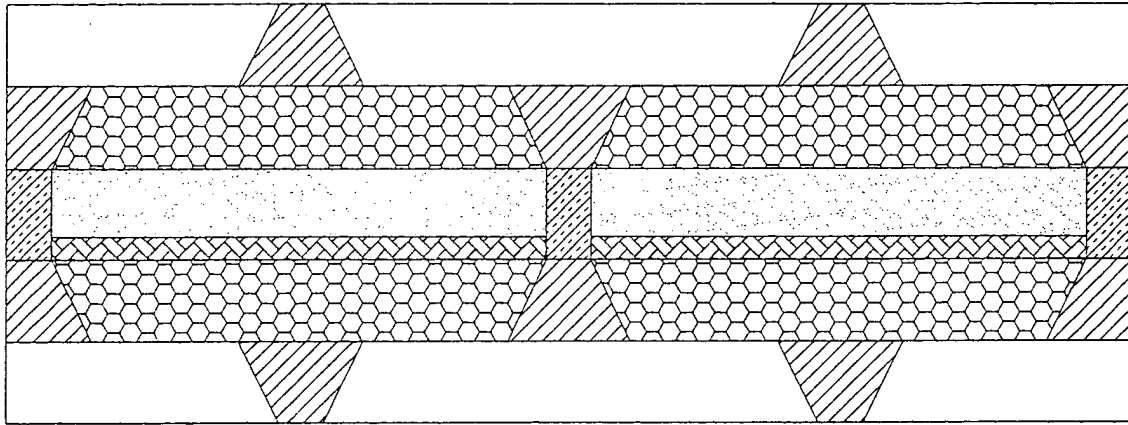
-  Substrate
-  Flow Channel & Cavity for Porous Medium
-  Sol-gel
-  Wafer Bonding Material







*Fig. 73*



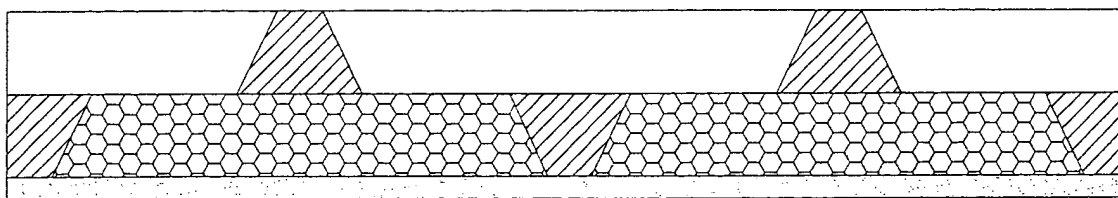
-  Substrate
-  Flow Channel
-  Sol-gel
-  Wafer Bonding Material
-  Methanol Barrier Layer





*Fig. 74*



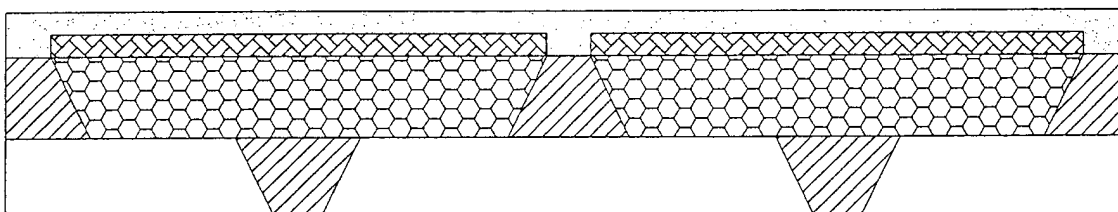
-  Substrate
-  Flow Channel
-  Sol-gel
-  Wafer Bonding Material
-  Methanol Barrier Layer
-  Electrolyte






*Fig. 75*



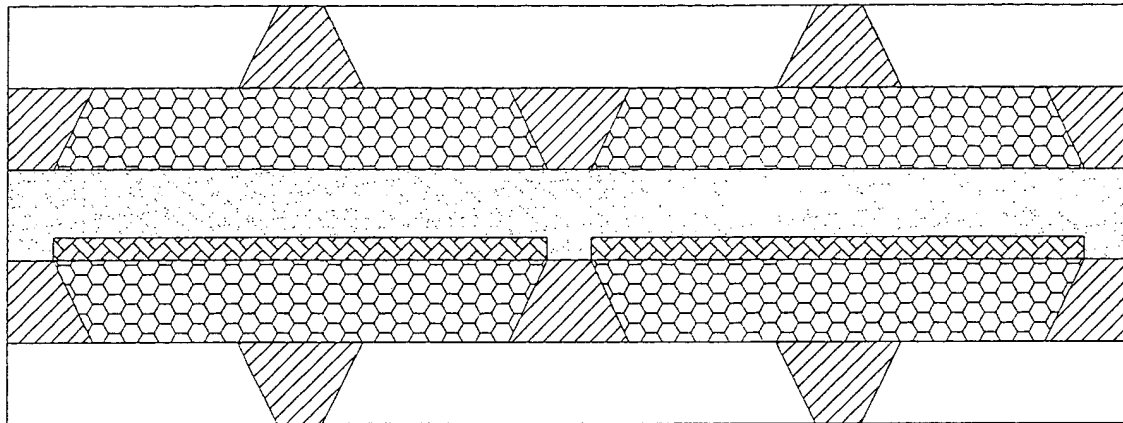
-  Substrate
-  Flow Channel & Cavity for Porous Medium
-  Sol-gel
-  Electrolyte






*Fig. 76*



-  Substrate
-  Flow Channel
-  Sol-gel
-  Electrolyte
-  Methanol Barrier Layer

*Fig. 77*



-  Substrate
-  Flow Channel
-  Sol-gel
-  Electrolyte
-  Methanol Barrier Layer

*Fig. 78*